NETWORK WORLD

The Newsweekly of Enterprise Network Strategies

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FCC moves liberate the local loop

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — In a blow to the RBHCs' lock on the local exchange, the Federal Communications Commission last week moved to open up local loops to competition and overhauled local access service rates.

The agency gave alternative carriers freedom to compete for a key portion of local access business — delivery of private-line traffic from local central offices to long-distance providers — and it backed collocation of alternative carrier equipment in those central offices.

In addition, the FCC proposed allowing competition for delivery of switched traffic. If that proposal is adopted, then all regional Bell holding company services the FCC controls will be open to competition.

The FCC also issued a long-awaited decision that revamps the method for calculating local carrier rates for delivering user calls to long-haul carriers. The restructuring is designed to bring access rates charged more in line

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PHOTO ©1992 DANIELLE SWICK

IBM's Donald Haile, Bill Warner and Richard Anderson (l. to r.) at Big Blue's product rollout last week.

IBM adds rich array of network products

Offers powerful new token-ring, fiber cards for FEPs, unwraps new router and intelligent hub.

By Michael Cooney
Senior Editor

NEW YORK — In what has become an annual September event, IBM last week rolled out a wealth of products that address user requirements for everything from front-end processor (FEP) performance enhancements to LAN hubs and low-end routers.

Included among the new wares is an expansion shelf for the 3745 Communication Controller that supports powerful new Token-Ring Interface Couplers (TIC) and adapters that offer fiber-optic links to mainframes. IBM also unveiled a software-based bridge/router that lets OS/2 nodes act as feeders to its 6611 router and rolled out an intelligent local-area network hub from its alliance with Chipcom Corp.

IBM tailors TCP/IP manager for more distributed role. Page 89.

"These products will help users continue to grow their large networks but also help them handle their growing local-area networks," said Don Haile, director of IBM's local-area networking.

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Users, vendors unite in blasting FBI wiretap plan

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Users and vendors last week united in opposition to a Federal Bureau of Investigation proposal for a new wiretap law that would give the agency sweeping powers over network equipment design.

The proposed legislation, dubbed Digital Telephony and Interception, would give the FBI the power to mandate communications equipment design changes that make it easier for law enforcement agencies to monitor voice and data traffic on local- and wide-area networks. While the Bush administration last week urged Congress to pass the legislation, 35 user, vendor and industry groups declared their opposition (see graphic, page 90).

An industry-user opposition statement released last week said the FBI proposal could result in the redesign or expensive alteration of public mail systems, tele-

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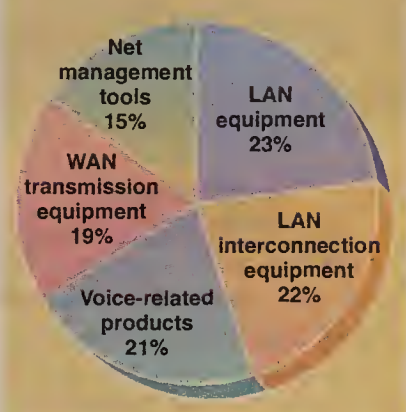
The buys remain the same

1993 capital spending



Figures are almost identical to 1992.

GRAPHIC BY SUSAN SLATER
SOURCE: *NETWORK WORLD*

Budget woes may hamper net projects

By Joanne Cummings
Senior Writer

The reality of a sagging economy is forcing many network managers to scale back investments in new projects and closely guard expenditures for existing services for next year.

Network World's 1992 Annual Budget Survey reveals that net budgets will essentially remain flat, dipping less than half a percentage point on average from this year. The survey pegs the average 1993 budget of the 309 respondents at $7.07 million, vs. $7.10 million in 1992.

Even more striking though is the difference in network managers' outlook. This time last year, many net managers planned spending increases of about 6% for 1992, optimistic that their

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NETLINE

FEDERAL ADVISORY BOARD to recommend U.S. cryptography policy. Page 2.

SYNOPTICS DRESSES up Unix-based net management system in new robes. Page 4.

SYBASE TOOLS more tightly integrate IBM mainframes into client/server nets. Page 6.

3COM PRODUCT BARRAGE includes new line of token-ring interfaces. Page 8.

APPEAL OF DME pursuades Cabletron to comply with net mgmt. specification. Page 8.

PROTEON PACKAGES router, hub in a single device. Page 8.

BUYER'S GUIDE examines switch-to-computer interface software. Page 61.

NEWSPAPER

Test focuses spotlight on interoperability of routers

By Maureen Molloy
Senior Writer

In the two years since it was developed to facilitate interoperability among routers in multivendor internetworks, the Open Shortest Path First (OSPF) interrouter protocol has quickly gained acceptance.

As a standard for Transmission Control Protocol/Internet Protocol internetworks, OSPF was designed to overcome many of the shortcomings of the older Routing Information Protocol (RIP) — the first router-to-router standard for TCP/IP internets.

With a growing number of vendors pushing OSPF support as a sign of their commitment to interoperability, *Network World* decided to put the protocol under the microscope in the first independent multivendor OSPF test.

NETWORK WORLD'S R.A.F. READER ADVOCACY FORCE

Under the aegis of consultant Scott Bradner of Harvard University's Office of Information Technology in Cambridge, Mass., the test was performed at Harvard's Network Device Test Lab and

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Frame Relay Forum OKs interoperability document

Network-to-Network Interface intended to ensure compatibility of frame relay equipment, services.

By Bob Brown
Senior Editor

SAN FRANCISCO — The Frame Relay Forum last week said it has approved an implementation agreement that paves the way for interoperability among multiple vendors' frame relay switches and services.

The Network-to-Network Interface (NNI) is designed to let frame relay devices from different vendors communicate, which will enable private and public nets based on those devices to interoperate.

By year end, many equipment vendors expect to support NNI, which is designed for permanent virtual circuit (PVC)-based frame relay nets.

In fact, Cascade Communications Corp. of Westford, Mass., and Hughes Network Systems of Germantown, Md., have already implemented NNI on their gear and are planning to hold their own interoperability demonstration in Germantown later this month.

"NNI will greatly expand the geographical reach of frame relay so that it will truly be a global service," said Alan Taffel, president of the Frame Relay Forum

(continued on page 8)

Sprint execs detail plans for emerging technologies

Will launch ATM and SONET net test projects.

By Bob Wallace
Senior Editor

RESTON, Va. — In a briefing here last week with *Network World,* Sprint Corp. detailed how it will explore emerging switching platforms and transmission systems to increase network capacity and support high-speed data applications.

The projects will include a field trial of Synchronous Optical Network (SONET) local loops as well as the use of SONET to support bandwidth-hungry applications, Asynchronous Transfer Mode (ATM) switch interoperability testing and a test of SONET equipment.

"The only way to learn about the pros and cons of these different systems is to put them to the test in our labs or in the field," said Terry Kero, director of Sprint's advanced technology laboratories in Burlingame, Calif. "Then we'll know what can be used to improve the Sprint network."

In the first project, Sprint will install a SONET Optical Carrier (OC)-12 (622M bit/sec) backbone ring from Burlingame to Palo Alto, Calif., that will link two smaller SONET metropolitan-

(continued on page 90)

Board to review U.S. policy on uses of cryptography

By Ellen Messmer
Washington Correspondent

GAITHERSBURG, Md. — With support from users and vendors, the Computer System Security and Privacy Advisory Board (CSSPAB) last week voted to take the first steps toward a national review of civilian and defense cryptography.

The CSSPAB is chartered by Congress to identify policy issues. It will begin its review by having the National Institute of Standards and Technology (NIST), one of the 12 CSSPAB members, gather information on the laws and uses of cryptography worldwide to see where U.S. policy on export controls and commercial use of encryption products fits in.

The board will also approach Congress and government agencies to garner support for the cryptography review.

The 12-member CSSPAB is composed of vendors such as IBM and Trusted Information Systems, Inc., users such as Citibank, N.A. and Fidelity Investments, and government agencies including NIST and the National Security Agency (NSA).

The CSSPAB's interest in con-

(continued on page 92)

Briefs

Microwave users get the heave-ho. The Federal Communications Commission last week finalized its decision to move microwave users out of their current spectrum in order to establish a block of frequencies for emerging technologies such as personal communications services (PCS). The frequencies designated are in the 1.85-GHz to 2.2-GHz band used by many microwave users today. Although the FCC has not decided which services will qualify for use in those frequencies, FCC engineer Thomas Stanley said as much as half of the capacity may go to PCS.

Microwave users have fought bitterly to keep from moving to higher frequencies. Under FCC rules outlined last week, they will have three years in which to relocate to new frequencies. After that period, new service providers can request an involuntary relocation but must be willing to pay for all relocation costs.

Sniffing out internet problems. Network General Corp. this week will extend its local-area network analyzer technology to the internetwork arena with the introduction of three modular Sniffer Internetwork Analyzers. The devices, which offer expert system-based problem solving for router-based internetworks, can pinpoint network bottlenecks and offer suggestions to improve bandwidth use, application throughput and response times.

NIST backtracks on DSS proposal. The Department of Commerce and the National Institute of Standards and Technology (NIST) last week opened up patent negotiations with Public Key Partners, Inc. (PKP) — holder of the rights to RSA Data Security, Inc.'s encryption technology — for the NIST-proposed Digital Signature Standard (DSS). Although NIST had earlier asserted that DSS would be royalty-free, Commerce Department officials asked PKP to submit a proposed fee structure on how it would license DSS to commercial vendors.

AT&T proposes Megacom credits. AT&T last week proposed offering onetime credits to Megacom customers and users that switch back to the service from another carrier. Pending Federal Communications Commission approval, the carrier will provide onetime usage credits ranging from $1,250 to $50,000 to firms that sign one-year or multiyear contracts for Megacom services, which include Megacom Plus, Megacom WATS and Megacom 800.

The Lego approach to networking. SynOptics Communications, Inc. on Oct. 5 will announce a new line of 16-port stackable 10Base-T Ethernet hubs. As many as five of the hubs, which are targeted at users in remote offices, can be stacked together and managed through one Simple Network Management Protocol-based management module. The company is also expected to detail its Asynchronous Transfer Mode strategy and introduce a line of low-cost transceivers. SynOptics declined comment on these announcements.

Defense Department consolidation moves forward. Donald Atwood, deputy secretary of defense, last week authorized the consolidation of the Department of Defense's information technology assets, transferring computer and communications resources operated by the U.S. Navy, Army and Air Force to the Defense Information Systems Agency. The move is expected to transfer more than 100,000 defense personnel to that agency and consolidate 1,700 data processing centers into 20 megacenters nationwide.

CONTACTS

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SynOptics puts new name, face on its Unix-based net mgmt. system

By Skip MacAskill
Staff Writer

SANTA CLARA, Calif. — SynOptics Communications, Inc. this week will unveil an enhanced and renamed version of its Unix-based net management platform as well as a new set of applications that together will ease a variety of management tasks. Optivity 1.0, the new name for SynOptics' LattisNet Manager for Unix 2.2 net management system, attempts to simplify the use of the Simple Network Management Protocol for net administrators.

"Users were telling us that their SNMP data was too complex to handle," said Clive Hallatt, product manager for SynOptics. "We've addressed that problem with a new approach that offers management views at the internetwork level, the segment level and the nodal level."

This appears to dovetail with needs identified by a recent net management study performed by Infonetics Research, Inc., a consultancy in San Jose, Calif.

"We found that net managers' primary concern was a reduction in the time it takes to resolve a network problem," said Michael Howard, president of Infonetics. "One way to do that is to present managers with higher level tools that can sort through the reams of information generated and make sense out of what is occurring on the net. Optivity can do that."

Optivity is the high-end Unix version of SynOptics' network management system line, which also includes the mid-range LattisNet Manager for DOS and Lattis EZ-View, which provides low-cost port-level management of small and midsized Ethernet local-area networks.

Optivity runs on a management console under SunConnect's SunNet Manager and is used to control multiprotocol token-ring, Ethernet and Fiber Distributed Data Interface LANs from a central management location.

New features include Autotopology Plus, which provides real-time automatic discovery of the devices on a routed network, such as intelligent hubs, routers, bridges and end stations, and automatically maintains the topology map depicting the network.

Also included in the new version is Nodal Views, which offers management visibility down to the end-node level. It can provide a graphical representation of the node as well as information such as error statistics. Net managers can also use the capability to set performance thresholds and corresponding alarm trips.

With Optivity, the first three layers of the Open Systems Interconnection model — physical, data link and network — can be managed as one system instead of disparate elements, according to Hallatt. The previous version only dealt with the data link layer.

Optivity will be available by the end of October for $4,995. A $400 upgrade program for existing LattisNet Manager for Unix users will also be available at that time.

SynOptics also rolled out new management applications for Optivity, which include PathMan, BridgeMan and RouterMan. PathMan allows a manager to trace the transmission path of a packet from one Internet Protocol address to another.

RouterMan, which SynOptics codeveloped with Cisco Systems, Inc., provides real-time status of routers on the network, while BridgeMan automatically identifies and shows the status of all bridges on the net.

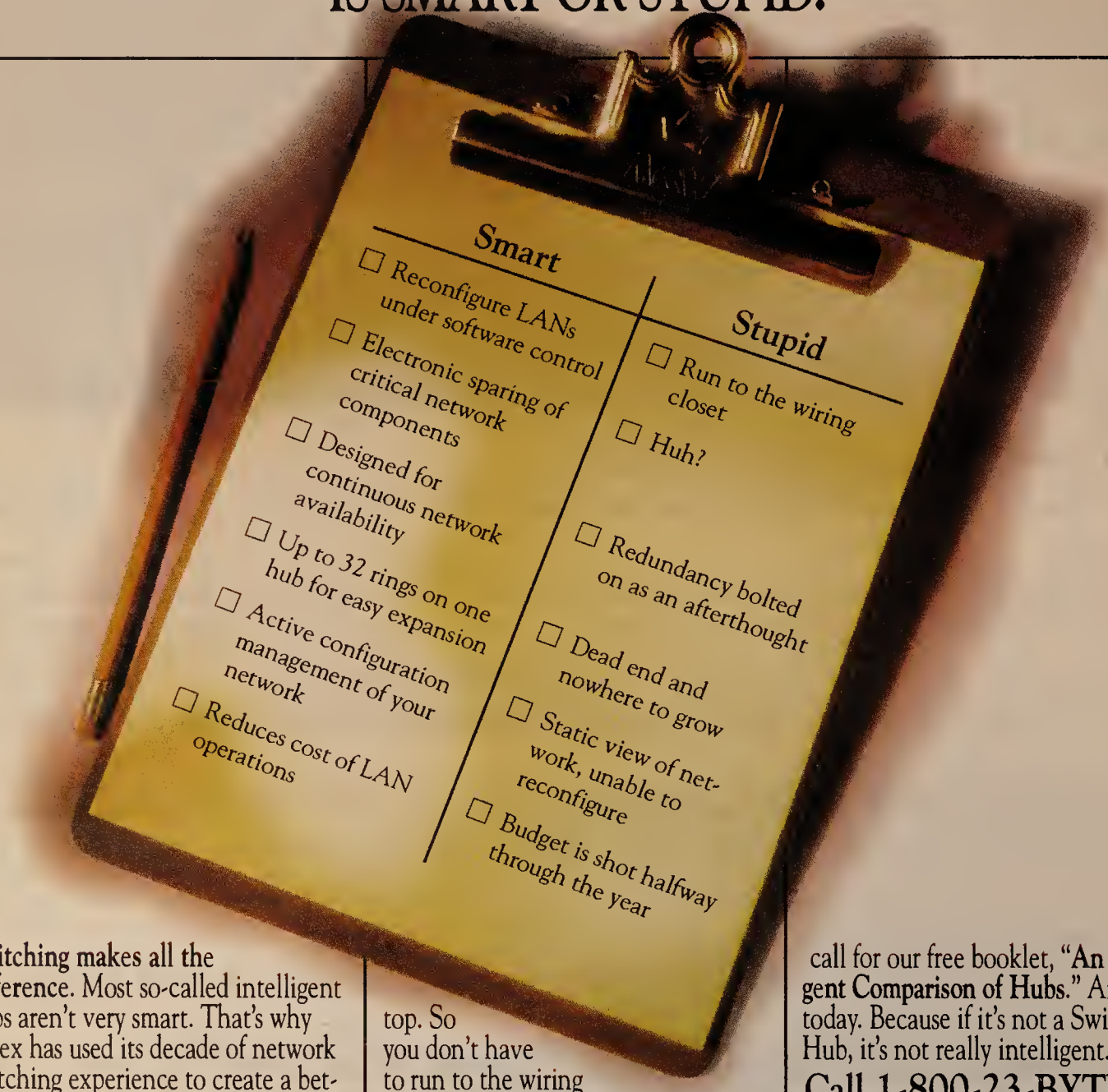
RouterMan, priced at $3,495, is already shipping. PathMan and BridgeMan will be available next month and cost $3,995 and $2,495, respectively.

SynOptics also announced it has added support for Version 3.0 of NetMetrix, the LAN monitoring and analysis tool set from Metrix Network Systems, Inc. that runs on top of Optivity. Through the use of Internetwork Monitor, NetMetrix's newest tool addition, managers can track internetwork traffic by application, source, destination, time and protocol.

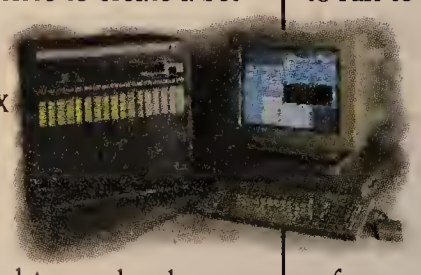
Version 3.0 will ship in 30 days. License prices start at $1,995 per tool.

Correction: Last week's article on Sprint Corp.'s Voice FONCard ("Voice-activated FONCard inches to the starting gate") incorrectly stated that the carrier's standard FONCard does not feature three-way conference calling and message delivery. In fact, both features are available on both cards.

HOW TO TELL IF AN INTELLIGENT HUB IS SMART OR STUPID.



Switching makes all the difference. Most so-called intelligent hubs aren't very smart. That's why Bytex has used its decade of network switching experience to create a better approach to intelligent hubs—the Bytex Series 7700™ Intelligent Switching System.



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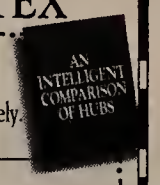

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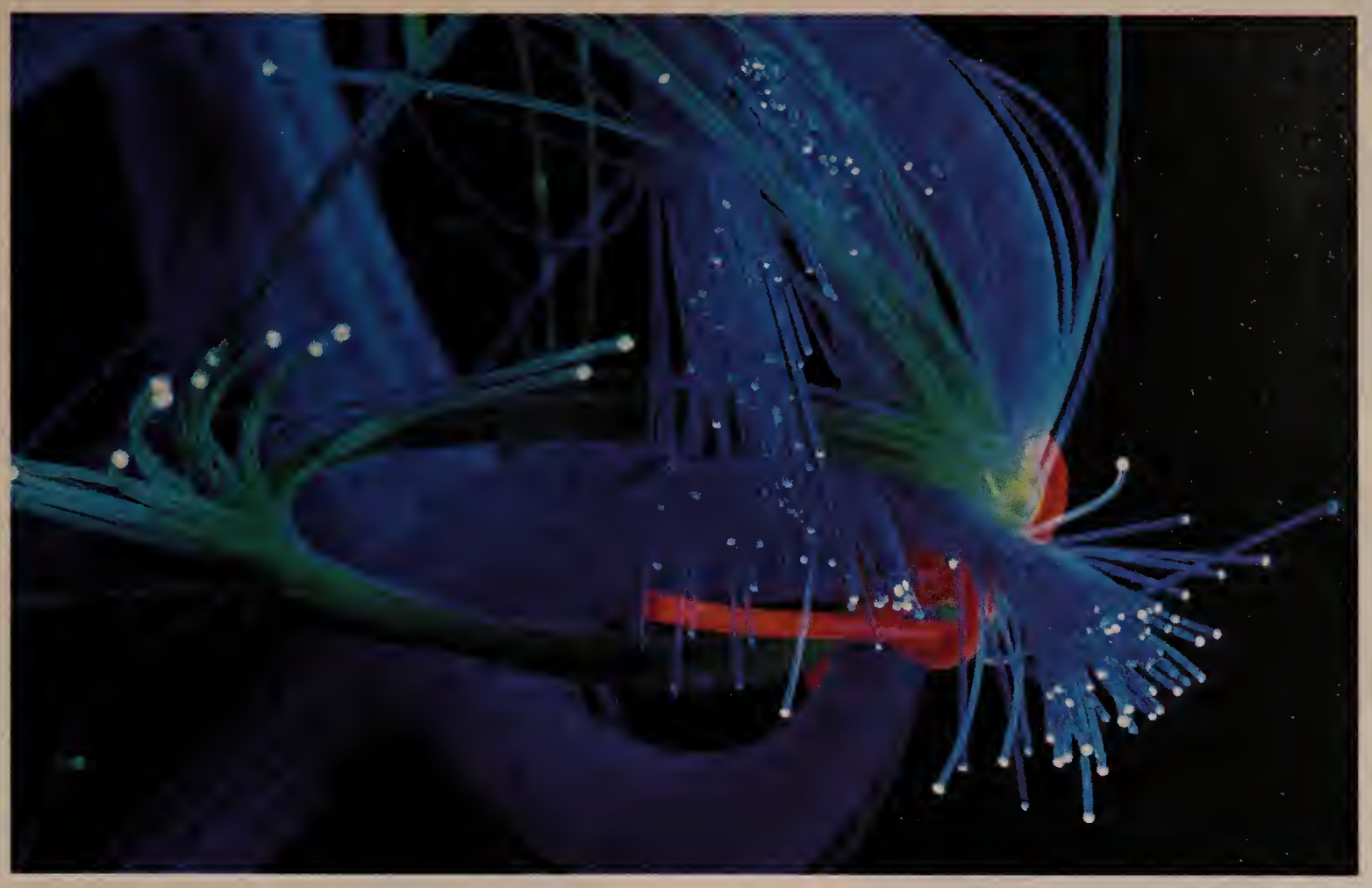

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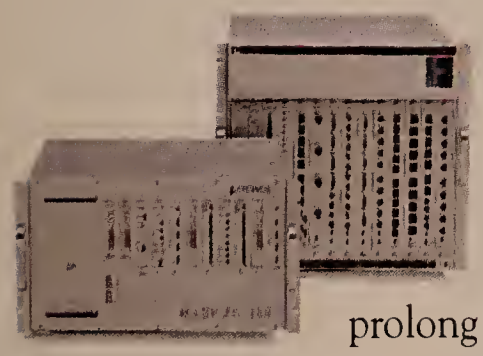

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Circle Reader Service #111

Sybase wares strengthen role of IBM hosts in client/server nets

By Timothy O'Brien
West Coast Bureau Chief

EMERYVILLE, Calif. — Sybase, Inc. last week announced new and enhanced products that provide tighter integration of IBM mainframes into client/server environments.

Among the new products is host-based software that enables the mainframe to act as a client and a server in a client/server network, as well as a gateway product that gives OS/2 users access to the mainframe.

"Years ago, users were given a way to access mainframe data from their LANs," said Steve Knowles, group product manager for connectivity at Sybase. "Today, it is just as important for users to have LAN applications and data available to the mainframe."

The cornerstone of the host integration announcements is the Sybase Open Client for CICS, which lets IBM 3270 users and CICS applications access local-area network-based databases, applications and services such as net management utilities.

Open Client for CICS lets users request data from Sybase SQL Server systems and other data sources, including Oracle Corp.'s Oracle Server. In addition, CICS applications can automatically issue SQL commands or remote procedure calls (RPC) to update databases on departmental servers or workstations. An application working through Sybase's Open Client does not need to know where the data is stored.

Sybase also announced the host-based Sybase Open Gateway for DB2 Release 2.0, which adds support for RPCs based on Microsoft Corp.'s Open Database Connectivity specifications. The gateway enables query tools and applications on a variety of platforms to transparently access DB2 just as they access SQL Server. The product obviates the need for these client applications to know specific DB2 commands.

In addition, Sybase introduced the Sybase Net-Gateway for OS/2, an OS/2 server-based product that lets LAN-attached personal computer users access mainframes. The product maps client application calls to CICS transactions.

In addition, it supports multiple simultaneous connections from the LAN to the mainframe and works with a variety of protocols, such as IBM's LU 6.2, the Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) and LAN Manager.

> "It is important for users to have LAN applications and data available to the mainframe," said Sybase's Knowles.
>
> ▲▲▲

As part of this announcement, Sybase introduced the Open Server for OS/2, a version of the programmable server product that allows client access to non-Sybase data, services and applications in the OS/2 environment. With this product, client tools and applications running on various platforms interact with non-Sybase data and applications in the same way they work with SQL Server. As a result, the Open Server interface can be used independently of SQL Server to build distributed client/server applications.

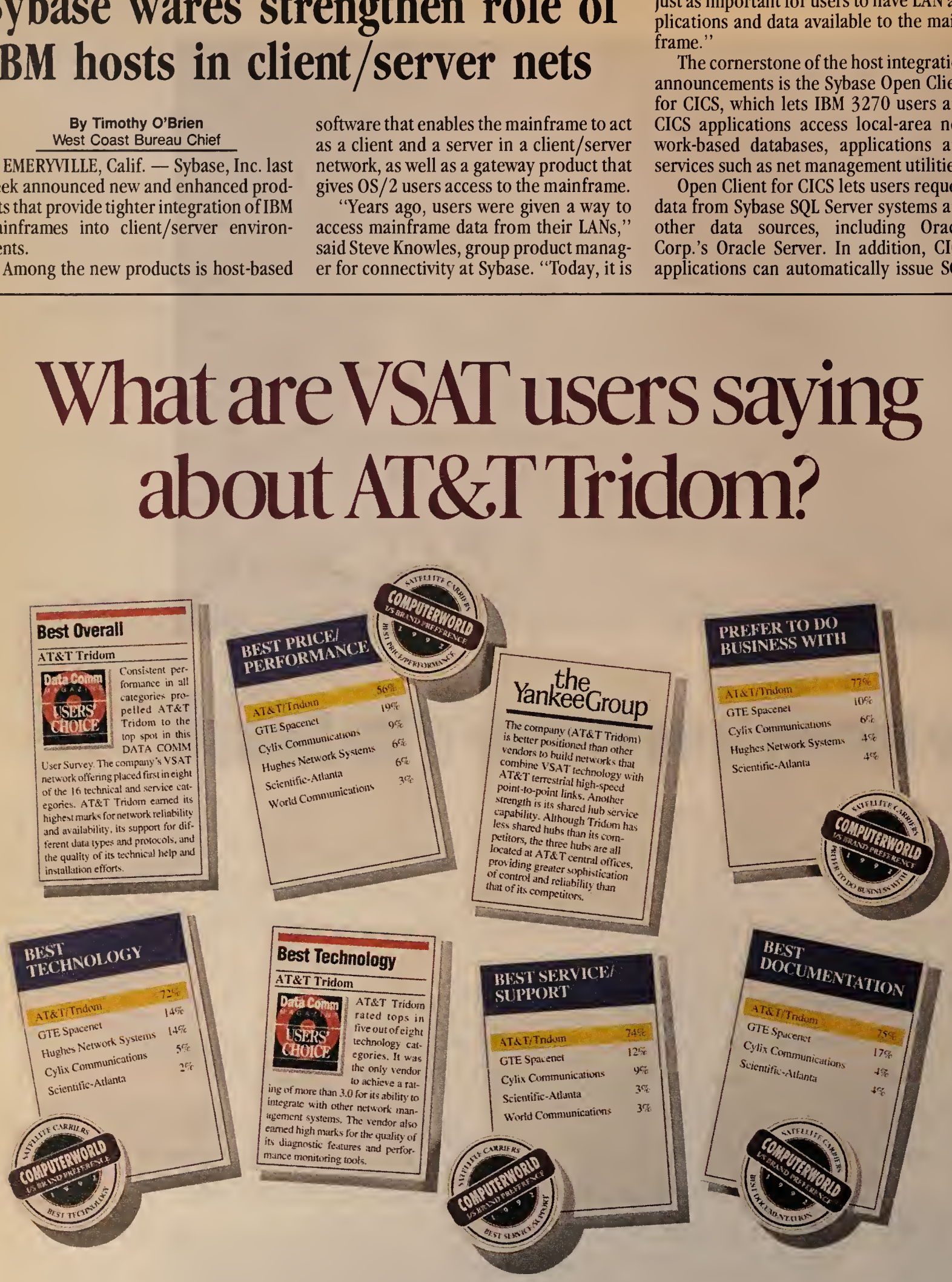
These new products build on the existing mainframe integration products Sybase introduced in 1990. Among those is the Sybase Open Server for CICS, which enables the host to act as a server, providing access to CICS applications in a client/server environment.

Other products include the Unix-based Sybase Net-Gateway, which routes SQL requests and RPCs to DB2 and CICS applications.

The Sybase Open Client for CICS, Sybase Open Gateway for DB2 2.0, Sybase Net-Gateway for OS/2 and Sybase Open Server for OS/2 products are currently in beta test. They will be available in the fourth quarter.

Open Client for CICS is priced from $32,040 to $64,040, while Sybase Open Gateway for DB2 2.0 is priced from $102,530 to $204,930. Prices vary depending on number of users. Sybase Net-Gateway for OS/2 and Sybase Open Server for OS/2 are priced at $2,495 each.

What are VSAT users saying about AT&T Tridom?



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Deborah Brock
Manager, PC and Network Services
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Token ring shines in 3Com launch of product barrage

Ethernet, net management products also on deck.

By Skip MacAskill
Staff Writer

BOSTON — In a product rollout that touched on almost every area of its business, 3Com Corp. last week introduced a wide range of token-ring, Ethernet and net management offerings.

3Com's second big token-ring splash in as many weeks included a new line of token-ring adapter cards and token-ring routing capabilities for its NetBuilder II line of bridge/routers.

PHOTOGRAPHY©1992 JOHN THOMPSON
Eric Benhamou

Two weeks ago, the company announced software enhancements to the NetBuilder I bridge/router family that provided full token-ring routing as well as routing of traffic between Ethernets and token ring.

"One of the key pieces that was missing from our portfolio was token ring," said Roy Johnson, director of 3Com's Network Adapter Division. "We needed to bring in token ring in order to have a well-rounded solution."

The company also revealed the first fruits of its acquisition of BICC Data Networks, Inc., including a new line of Ethernet stackable hubs and a hub card for NetWare servers.

At the heart of the new token-ring thrust is the new line of TokenLink III 16/4 network adapter cards, which support both 4M and 16M bit/sec local-area network speeds. Based on the IBM-developed Token Ring Protocol Interface Controller (TROPIC) chipset, the TokenLink III family includes an Industry Standard Architecture (ISA) 16-bit model, a Micro Channel Architecture (MCA) 16-bit version and an Extended ISA 32-bit card.

The use of the TROPIC chip gives 3Com the ability to offer 100% IBM compatibility, setting it apart from many of its rivals, which use a Texas Instruments, Inc. chipset in their cards, according to Johnson.

The adapters can be connected to shielded or unshielded twisted-pair wiring without an external media filter and support distances up to 100 meters at 16M bit/sec over voice-grade unshielded twisted pair when connected to a retiming concentrator.

The ISA adapter is available now for $695. The EISA and MCA models will be available in October for $1,095 and $745, respectively.

Another of the company's token-ring rollout was the single-port NetBuilder II Token-Ring module, which plugs into the eight-slot NetBuilder II chassis and offers source routing bridging, Source Route Transparent bridging and full translation bridging.

As many as eight of the new modules can be used in a single NetBuilder II. The new module, which works with both 4M and 16M bit/sec token ring, will be available in December for $2,995.

3Com has licensed IBM's Advanced Peer-to-Peer Networking (APPN) Network Node specification and is beta-testing APPN routing code in its labs. It expects to demonstrate APPN routing features before year end and deliver APPN support by the first half of 1993.

"The APPN demo really throws cold water on Cisco [Systems, Inc.'s] Advanced Peer-to-Peer Internetworking announcement made two weeks ago," said Paul Callahan, a senior analyst at Forrester Research, Inc. "They may very well be the first vendor to deliver a true-Blue implementation of APPN."

The firm expects to offer 802.2 Logical Link Control 2 tunneling over Internet Protocol net backbones by the first quarter of 1993, enabling users to route

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Proteon packages hub with combination bridge/router

By Maureen Molloy
Senior Writer

WESTBOROUGH, Mass. — Proteon, Inc. will announce today the first fully homegrown combination hub and bridge/router, providing users with more tightly integrated configuration and management capabilities.

Some vendors currently offer hubs that include bridge/router modules supplied by another company, but the new Series 90/DNX 300m uses only Proteon technology. It is based on the firm's existing Series 90 Intelligent Network Concentrator and its Department Network Exchange (DNX) 300m bridge/router, and is designed for users in departmental or campus sites.

The Series 90/DNX 300m is a 10-slot hub that supports any combination of Ethernet and 4M and 16M bit/sec token-ring local-area networks. It can be attached to a wide-area network or Fiber Distributed Data Interface backbone via the integrated bridge/router module or through the vendor's CNX 500 bridge/router.

The offering is also equipped with a module that monitors and controls all other modules and enables users to obtain configuration information and execute configuration commands for the entire hub.

All the physical infrastructure elements of the router and hub can be managed from a single

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Interoperability document OK'd

continued from page 2

and director of product marketing at Sprint Corp. "It will also go a long way toward promoting multivendor interoperability."

Taffel noted that the forum is also working on business-oriented agreements that will complement the technical NNI agreement by standardizing the way carriers exchange billing and other information.

According to Steve Taylor, a principal at Distributed Networking Associates, a consulting firm in Greensboro, N.C., NNI will make it easier for users to access long-haul frame relay services via local frame relay services.

Also, such action will probably be less expensive than using private-line access, said Bill Mitchell, director of marketing at Cascade.

"This should lower the cost of entry for using frame relay," Mitchell said. "It all depends on how the LECs tariff their frame relay services."

NNI background

The NNI agreement is based on a similar User-to-Network Interface (UNI) implementation agreement that was approved by the forum earlier this year and includes both ANSI and CCITT standards. Whereas the NNI refers to switch-to-switch communications, UNI applies to termination equipment-to-switch communications.

NNI also goes beyond UNI to address bidirectional procedures for PVC management signaling and congestion control.

The NNI agreement will now be forwarded to the Open Systems Interconnection Implementor's Workshop for ratification, according to Rajiv Kapoor, chairman of the forum's technical committee and a product manager at AT&T.

NNI will also be submitted for inclusion in the Government OSI Profile, as was UNI, according to Kapoor.

Forum activities

Last week, the forum also announced the formation of chapters in Europe and Australia, as well as plans to launch another chapter in Japan. International expansion is key to the forum's goals of promoting the use and interoperability of frame relay products and services worldwide, Taffel said.

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Additionally, the forum last week in Dallas held the first in a series of frame relay user roundtable sessions, which included presentations by the forum, consultants and users. Upcoming roundtables will be held in New York on Oct. 6 and in Los Angeles on Nov. 17.

For additional information about the forum, call (415) 962-2579.

Cabletron pledges DME compliance

By Skip MacAskill
Staff Writer

Cabletron Systems, Inc. is expected to announce this week that it will make its Spectrum network management system compliant with the Open Software Foundation, Inc.'s (OSF) Distributed Management Environment (DME).

The move is part of Cabletron's strategy to open up its net management system to a wider range of customers and offer existing users more management options.

The company's support of the DME, which is a specification that defines a set of common application program interfaces (API) for multivendor net management platforms, should enable Spectrum to support more management applications. It should, for example, allow a net manager to buy any DME-compatible management tool set to run on top of Spectrum.

Although it declined to divulge details of this week's announcement, such as exactly how it will comply with the DME, Cabletron did confirm that it is working on a project to make Spectrum DME-compatible.

"The announcement to integrate Spectrum with the DME is just another step in our efforts to make Spectrum as open as possible," a Cabletron spokesman said. "Making Spectrum compatible with the DME is an important piece of that strategy."

The technology to join the DME and Spectrum will be developed in-house by Cabletron.

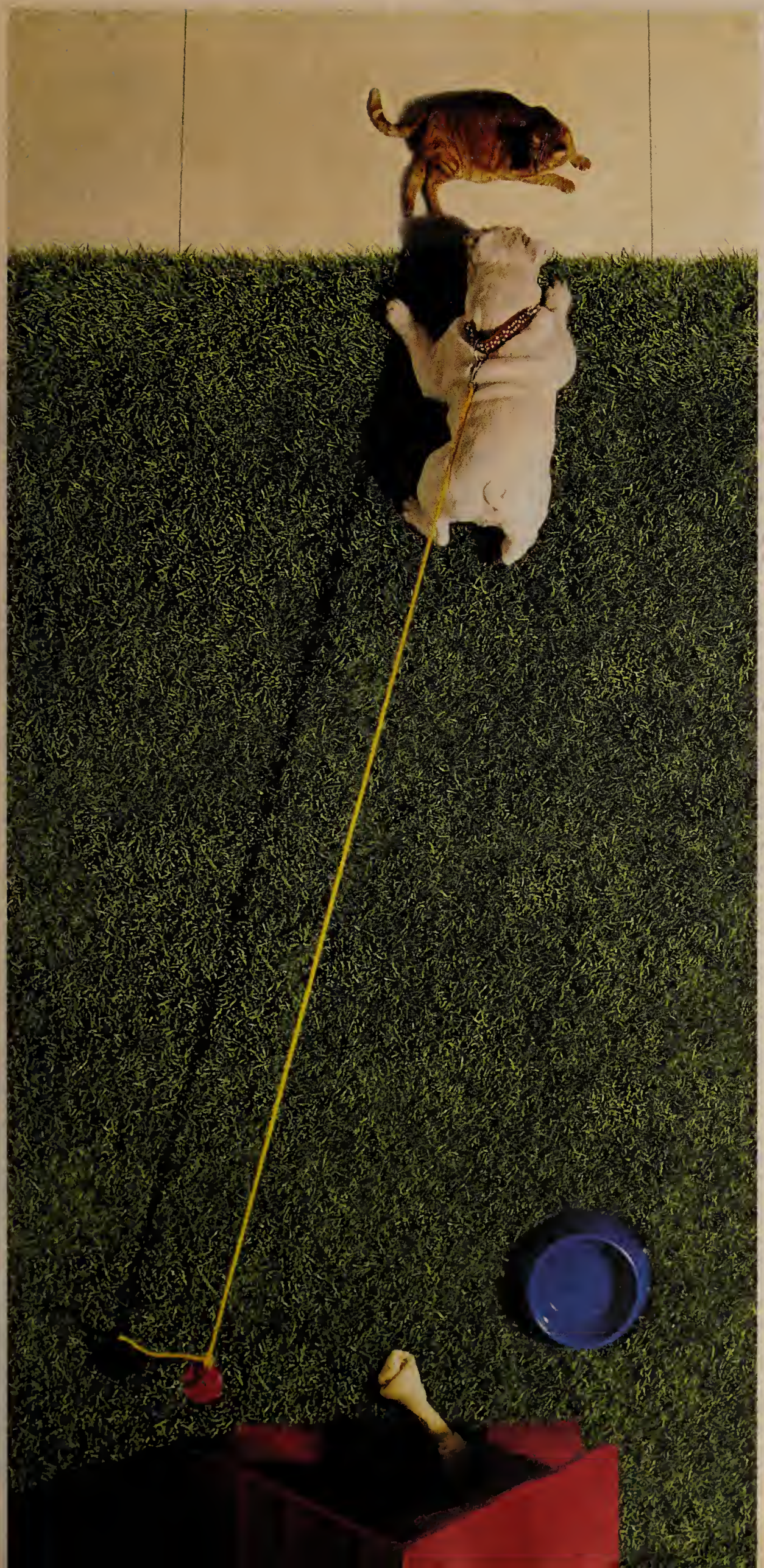
"Cabletron is allocating some of its development programmers to work on Spectrum applications that will be built to the DME interface," said Michael Howard, president of Infonetics Research, Inc., a consulting firm in San Jose, Calif.

DME support from the management platform vendors is essential if the DME has any chance of being successful. The outlook is encouraging, however, as companies such as Digital Equipment Corp., Hewlett-Packard Co. and IBM have said they would support the technology.

"Since the DME does represent 'the' management platform, it seems like a lot of companies are starting to rewrite applications for it," said Nick Lippis, a principal at Strategic Networks Consulting, Inc. in Rockland, Mass.

When coupled with the announcement last week that Cabletron was joining IBM's NetView Partners/6000 Program to ensure that its connectivity products can interoperate with IBM's AIX NetView/6000 net management platform (see Industry Briefs, page 41), the move toward DME reinforces the firm's commitment to interoperability, according to James Herman, a principal at Northeast Consulting Resources, Inc. in Boston.

"What may be more interesting [than the DME support] is Cabletron talking about working with IBM on NetView/6000," he said.



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Test focuses on interoperability

continued from page 1

spotlighted the OSPF implementations of nearly a dozen leading router vendors.

The good news? OSPF works well in a multivendor network. The three days of testing showed that users can rely on OSPF as a basic mechanism for ensuring interoperability among devices from a wide range of vendors.

But the effort also pointed out the need for additional interoperability testing to examine how optional OSPF capabilities will work in the real world and to find out how OSPF interacts with other routing protocols used today.

At times, things got a little crowded in the test lab.

Routing protocols

Routers use protocols such as OSPF and RIP to exchange information about the internetwork and to expedite recovery from failures. OSPF's primary enhancements over RIP are its ability to support larger nets and optimal routing based on a number of variables, as well as the addition of network management and security features.

The protocol was developed in 1990 by the OSPF Working Group of the Internet Engineering Task Force. It is currently a draft standard and is expected to be approved as a full standard by the Internet Architecture Board by year end.

Although not yet fully ratified, OSPF is widely available today and is considered to be the de facto routing standard that will soon supplant RIP in most user nets.

"Having a standard mechanism by which routers can communicate with one another is important for the growth of internetworking as a technology," said Gary Bowen, product marketing manager at Wellfleet Communications, Inc. in Bedford, Mass.

Users say vendor claims about OSPF are not just hype.

Eural Authement, a network development engineer at NASA Ames Research Center in Moffett Field, Calif., recently completed a yearlong project to build a 50-node OSPF-based router network.

"The interoperability needs some fine-tuning, but overall, it works well," Authement said. "Our OSPF net works. It wasn't easy, but I'd tell any other user who's interested in doing it that now is the right time."

Eric Benahmou, president of 3Com Corp., applauds the notion of multivendor OSPF routing but says interoperability testing is key to advancement of the specification.

"Everyone has focused on transport protocol interoperability. But if you really want to have practical interoperability, you need to test for routing interoperability" Benahmou said.

During the *Network World* test, 19 routers from 11 vendors interoperated using OSPF routing information over Ethernet, token-ring and Fiber Distributed Data Interface LANs.

The vendors that participated in the interoperability test were Advanced Computer Communications, Ascom Timeplex, Inc., Cisco Systems, Inc., Gandalf Technologies, Inc., Hewlett-Packard Co., Penril DataComm Networks, Proteon, Inc., 3Com, Vitalink/ Network Systems Corp., Wellfleet and Xyplex, Inc.

In the test, a multivendor internet was established linking routers over two 16M bit/sec token-ring backbone LANs, an FDDI backbone and a Synernetics, Inc. 10Base-T Ethernet hub acting as an Ethernet backbone. All four backbones were interconnected via a Cisco AGS+ router (see graphic, page 12).

Vendors were tested on each of the media types they support.

Of the 19 routers, five were housed on the FDDI backbone, three were on one token ring, four were on the second token ring and five were on the Ethernet hub. In addition, one router was attached to the second token ring and the Ethernet hub, and another was attached to the FDDI backbone and the Ethernet hub. Just to add to the complexity of the configuration, Bradner interconnected the two token rings with a router to provide another alternate routing path.

Interoperability

The test looked at four key OSPF performance metrics in multivendor nets, namely interoperability, convergence, designated router selection and the area border router function.

The interoperability portion of the testing explored how well the routers swapped routing tables and basic routing information. According to Bradner, each vendor performed well in this area of simple OSPF connectivity and OSPF mapping. The test showed that the routers could communicate and exchange actual data as though they were all from a single vendor.

A terminal attached to each router checked to see that packets were properly received at the other end and that a basic link was established between devices.

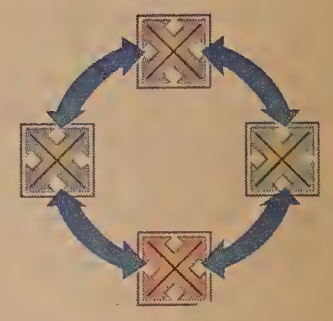
The routing tables were checked to determine that all router-attached LANs were known to each router and that each shared router the same network map.

With OSPF, routers do not exchange complete routing tables but rather information about the links each has to adjacent routers. Once tables have been established and the routers are synchronized, only keep-alive messages are sent, along with any routing changes that occur. Incremental updates are made only when the network topology changes, which means the protocol is miserly about bandwidth consumption.

"The test proved compatibility between all vendors of basic routing information and the ability to accurately swap routing table updates," Bradner said.

Convergence

The test also determined how well each vendor performed in the area of OSPF convergence, which is the time it takes for OSPF-compatible routers to detect that a link has gone down, determine an alternate path and reflect the changes in new routing tables. Rapid convergence is a key feature of OSPF that minimizes network disruptions.



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Harvard's Bradner (center) confers with participants during testing.

Programs sending out continuous streams of pings were started on two routers on different backbones linked by a Cisco router. The Cisco router was then turned off, and Bradner tested and recorded the elapsed time

(continued on page 12)

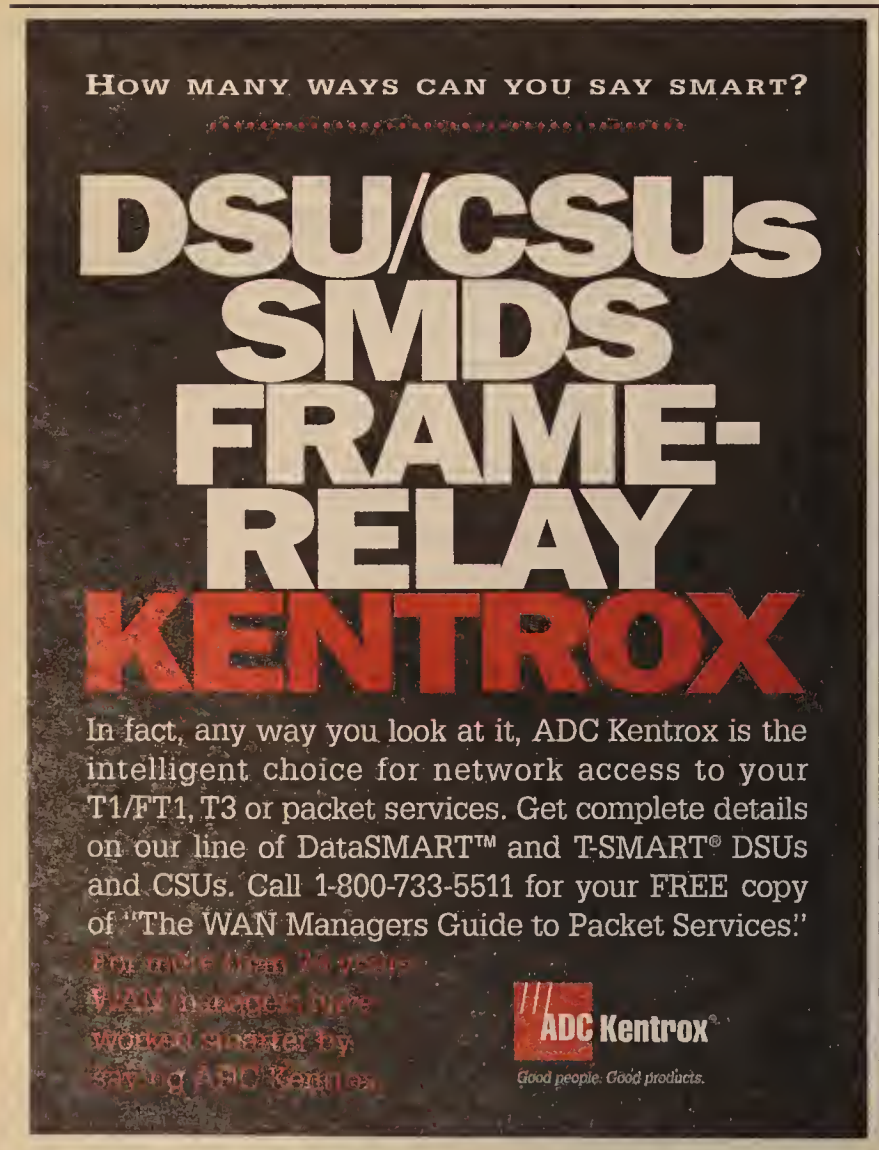
OSPF test methodology

The *Network World* OSPF Interoperability Test methodology was developed by the OSPF Steering Committee of the OSPF Interoperability Group and Scott Bradner of Harvard University in accordance with the Open Shortest Path First standard of the Internet Engineering Task Force (IETF).

Due to time and resource constraints, the test does not constitute an exhaustive examination of the OSPF standard. But it does explore the key functions of the protocol and demonstrates how well each of the participant's implementations fared in providing interoperability in a multivendor network.

Bradner is a consultant at Harvard's Office of Information Technology in Cambridge, Mass., and chairs the IETF's Benchmark Methodology Working Group. He also performs independent router performance tests for Interop, Inc.

This first independent OSPF test could not have been performed without the unprecedented cooperation of the OSPF Interoperability Group, whose efforts were spearheaded by John DePietro, an associate product analyst at Proteon, Inc., who helped coordinate vendor participation.



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Test focuses on interoperability

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from when the pings showed connectivity over an alternate route and when the vendor representatives reported that routing tables were updated showing the new pathways.

Convergence time included the time it took for the router to discover that a failure occurred, combined with the time it took for the device to find the alternate route, update its routing table and notify other routers of the change.

According to Bradner, convergence times for the different devices ranged from a low of 30 seconds to 45 seconds for the slowest participant.

Bradner declined to supply actual convergence times for each vendor since the test specification could not accurately determine which portion of the convergence time was a result of a particular vendor's OSPF algorithm and which resulted from the variables involved in alerting a router that a failure had just occurred.

"The significant measurement is whether the router's convergence time fell within the OSPF standard that calls for an average of 40 seconds, and the vendors clearly succeeded," Bradner said. "The vendors' implementations have fast convergence."

This quick convergence is a vast improvement over the seven-minute average convergence time of RIP and is faster than the average three-minute convergence time Cisco has reported for its proprietary Interior Gateway Routing Protocol.

According to John Moy, a senior staff engineer at Proteon and an author of the OSPF specification, fast convergence on a router is critical in order to keep the network from crashing.

Designated router selection

In broadcast networks such as Ethernet, several routers generally connect to the same physical network. In these multirouter environments, OSPF elects one router to act as a designated router, which then broadcasts routing information on behalf of every node in that network.

By culling data and performing broadcasts for every node in a particular physical network, the designated router reduces overall network traffic.

A third portion of the OSPF test determined if connectivity was maintained among multivendor routers each time a designation change was made.

To test this function, a router from each vendor was configured for token ring or Ethernet. All routers were turned off and a single one started. As the only router on the network, the device elected itself as the designated router.

Once it was determined that the designated router selection was solid, a second router from a different vendor was started on the same network. That router, in turn, elected itself as the backup designated router.

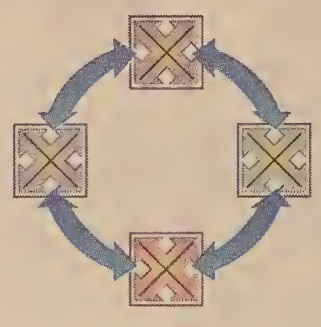
Once the backup was determined, a third router from still another vendor was powered up. Since designated and backup designated routers had already been established, the third router did not elect itself as either.

Then the first router was powered down. The backup router became the designated router, while the third router became the new backup router.

Each vendor's router was sequenced into the test, with each box going from nondesignated and nonbackup status to backup and designated status as the other routers were powered up and down.

A designated router is elected for every LAN segment in the internet, and its selection is a function of the OSPF protocol itself, not the user. Therefore, it is imperative that the protocol be capable of designated router selection because the user cannot manually configure a particular device to act as the designated router.

According to Bradner, the test showed that designated router and backup designated router negotiation worked well across



multivendor router nets. Each vendor's OSPF implementation was capable of working with another vendor's implementation to establish the correct designated router selection throughout the entire testing procedure.

"OSPF's ability to dynamically determine designated router status and fast convergence is important in allowing router internets to be more responsive to changes in user networks and to expend less routing overhead when doing so," Moy said.

Area border

Another key feature of OSPF is its ability to split OSPF-based internets into multiple areas via an area border algorithm. An area border allows an internet to be partitioned into smaller subdomains to reduce traffic throughout the enterprise network and boost security.

An area border router essentially condenses the topological information for other routers in its area and passes the information to another area border router via a predefined link. This allows the user to increase network size without fear of exceeding the routing protocol's capacity.

To test the area border function, the network was configured into two OSPF areas: the two token rings as one, and the Ethernet backbone as another.

A router from each vendor was connected to both of the areas and configured as an area border router. The input and output packet streams that flowed between the two areas were checked to determine whether routing information was being propagated successfully among routers in different area borders.

According to Bradner, all products worked as they should have, with the exception of the Ascom Timeplex router, which propagated the information in one direction but not the other. All other routers were capable of properly formatting and decoding the OSPF-area summary information.

What's next?

In short, Bradner said all of the vendors interoperated remarkably well in a network topology that mirrored a real-world worst case scenario.

"The resulting net was like a distributed purchasing system gone mad. It was as if every department in the enterprise chose its own router and backbone topology, and then tried to get them all to interoperate," Bradner said.

While the test was a positive first step in illustrating seamless OSPF interoperability among vendors, it did have some constraints. Due to time or functional restrictions, some key areas of OSPF were not tested.

The OSPF Interoperability Group and vendors in general should take the next step and perform interoperability testing that goes beyond what was achieved in the Harvard lab.

For instance, one key area the tests did not simulate is how each vendor's OSPF implementation interacts with RIP. The ability of the two to coexist is important since there is a large installed base of RIP-based routers in many user nets today.

Harvard's Scott Bradner

Specifically, vendors should work to develop, standardize and test methods to import external routing information into the OSPF system. This will then allow a large number of users with an installed base of RIP-based routers to more easily migrate to or coexist with newer OSPF-based networks.

In a real-world network, a user needs to understand how each vendor handles multiple routing protocols if they expect to seamlessly mix and match different vendors' gear as they migrate from RIP to OSPF.

According to Moy, no standard specification exists today to show vendors how to simultaneously run RIP and OSPF on their routers. Since there's no specification dictating how RIP and OSPF should interact, each vendor is left to its own devices in developing such a scheme.

"Each vendor currently develops a different architecture for exchanging routing information between routing protocols, making it difficult for various vendors to interoperate," Moy said. "This is a key area of OSPF interoperability that requires further development and is a candidate for future standardization."

Another area that was not tested is how OSPF interoperates over nonbroadcast nets such as X.25 and frame relay. Again, in many real-world networks today, users are interested in running OSPF over those types of wide-area links.

A third area of OSPF interoperability not tested was OSPF's Type of Service routing feature, which allows applications of differing characteristics to be routed over separate paths. This test was not performed because 3Com is the only vendor that currently offers this feature on its routers.

Moy cautioned, however, that Type of Service routing is an optional OSPF feature, so one vendor's lack of support for it would not affect its ability to interoperate with another vendor's router that does support it.

As a next step on the way to interoperability, the OSPF Interoperability Technical Working Group will meet this week at 3Com's headquarters in Santa

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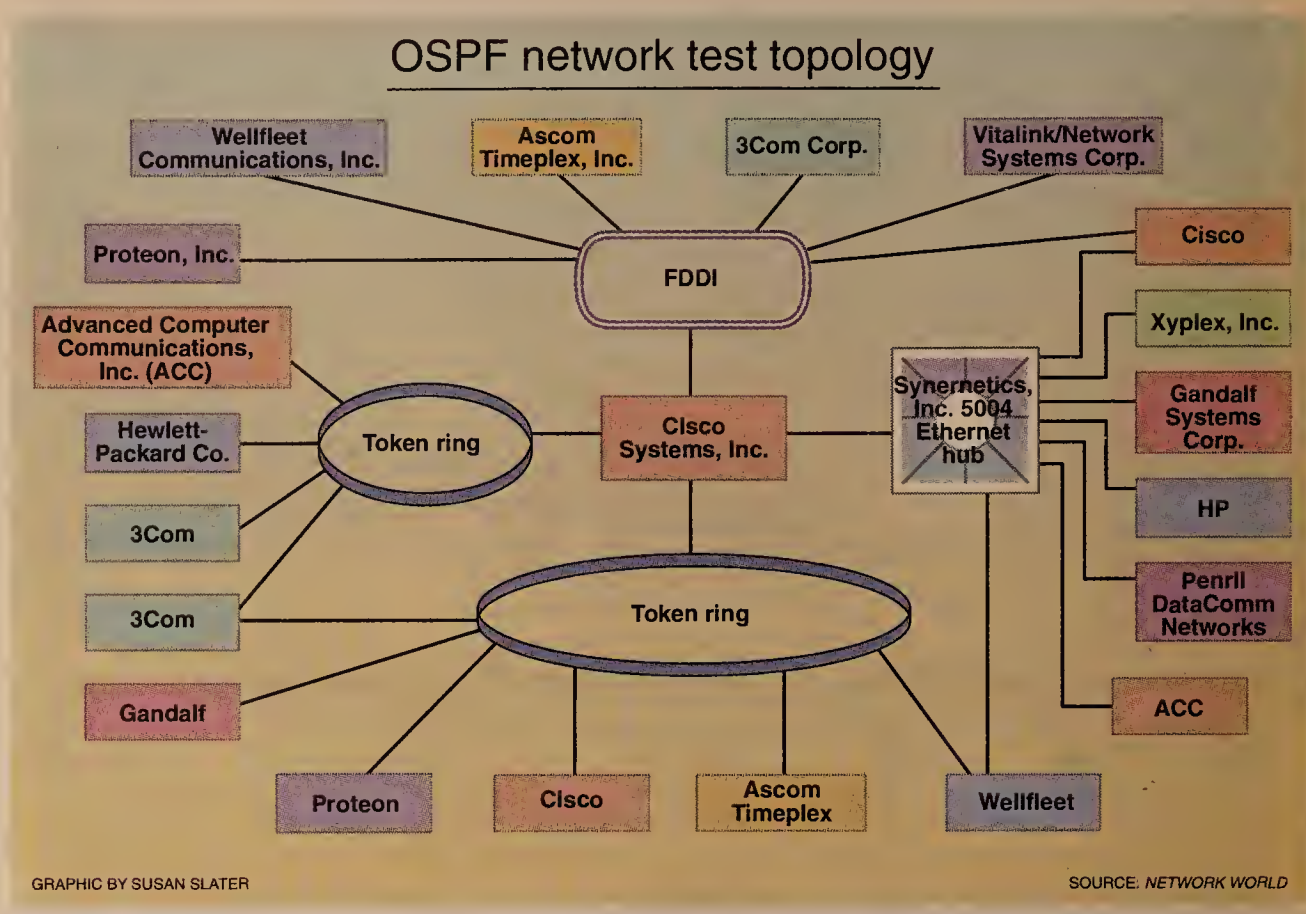

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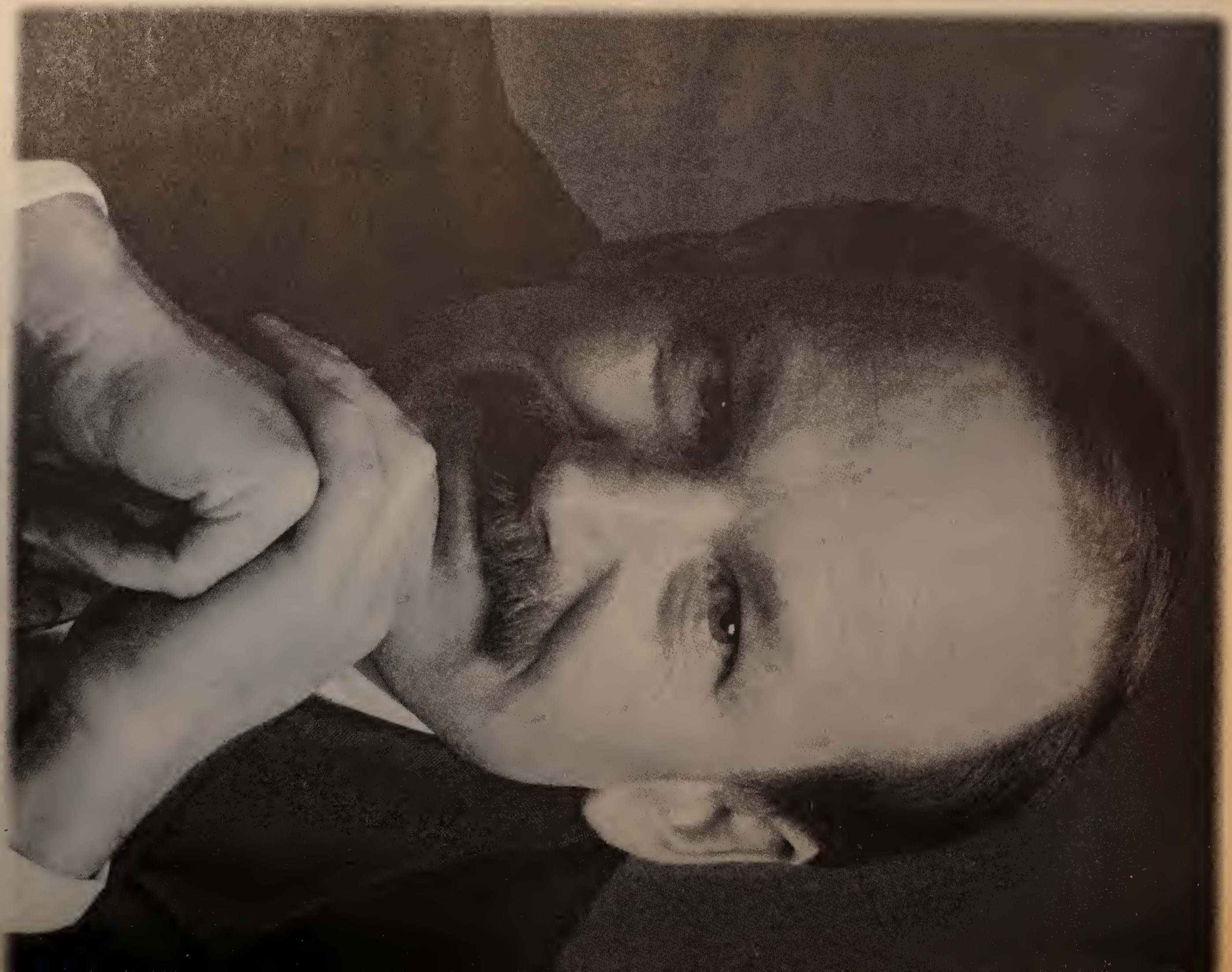

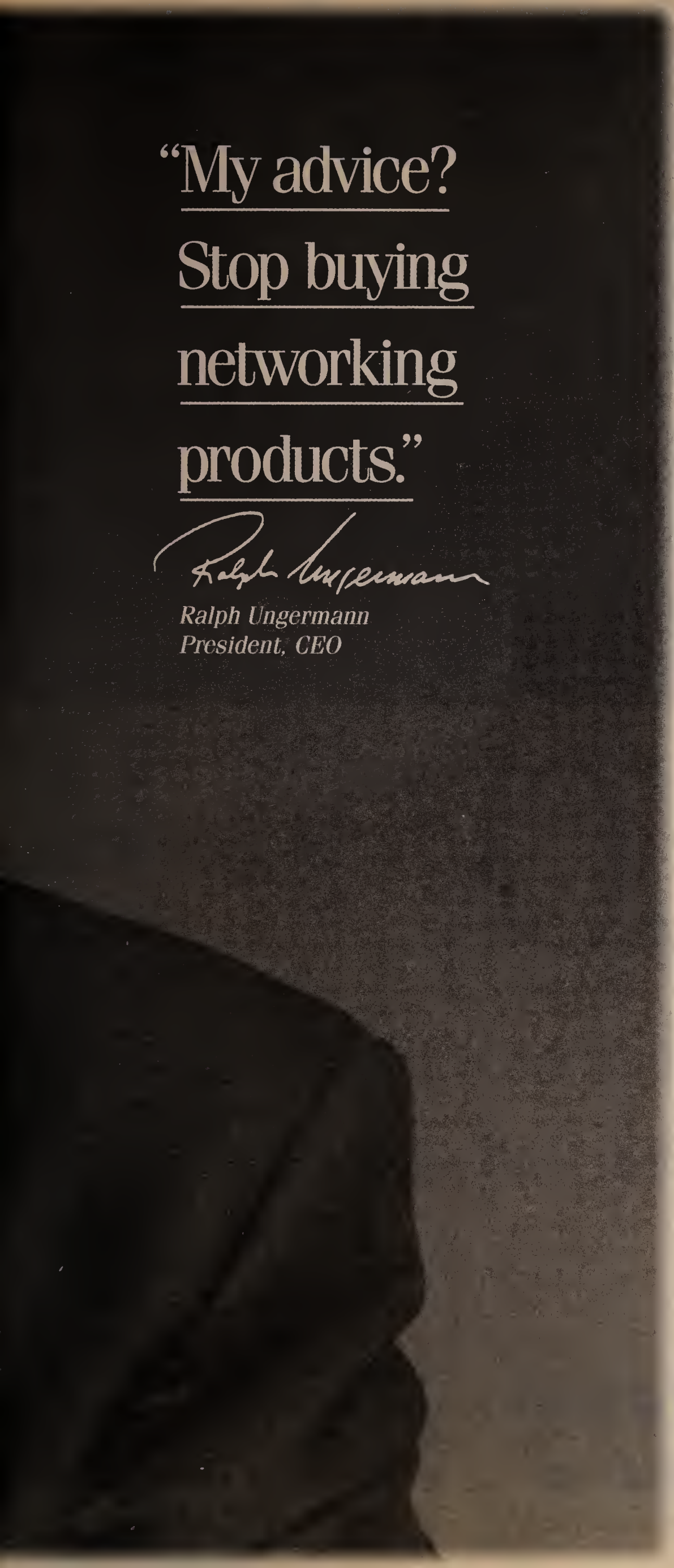

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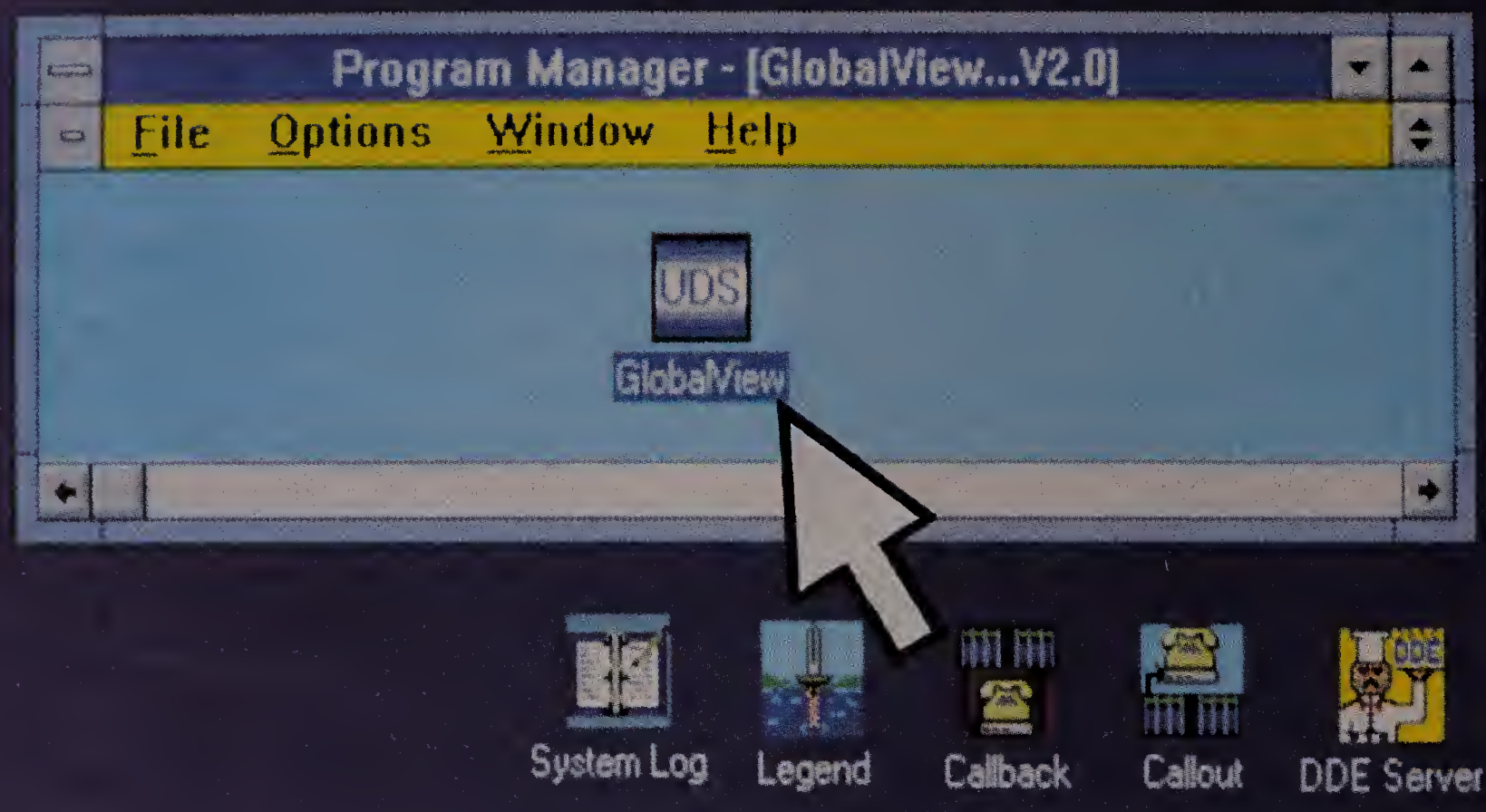

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1. Action requested

1 ☐ Request for sales call
2 ☐ Request for proposal
3 ☐ Request for information

2. Purchase timeframe

4 ☐ Within 60 days
5 ☐ Within six months
6 ☐ Within one year

3. Scope of purchase responsibility

7 ☐ Enterprise wide
8 ☐ Departmental

4. Purchase influence/number of sites

9 ☐ One site 11 ☐ 10-20 sites
10 ☐ 2-9 sites 12 ☐ 21+ sites

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115
116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
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161	162	163	164	165	166	167	168	169	170	171	172	173	174	175

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Worth Noting

"IBM has its own definition of open; it's any product it'll license to you for a lot of money."

Steve Morgenthal
Vice-president of networking
Unified Systems Solutions
Mountain Lakes, N.J.

Data Packets

Network Equipment Technologies, Inc. (NET) last week brought out a software downloading capability and a new data module for its ADNX/48 intelligent channel bank.

The software downloading capability lets users automatically download custom applications, network upgrades and configuration information to the ADNX/48 from the ANDX/48 Management System, which provides centralized control of ADNX networks. Carriers can use the new software capability to provide customers with new network services and applications, the company said.

The ADNX/48's new data module is said to reduce monthly access charges by enabling users to consolidate remote network traffic onto a single T-1 line. One data module attaches to a single data service unit at rates ranging from 2,400 bit/sec to 64K bit/sec in order to groom that traffic for the T-1 trunk.

The ADNX software download board is priced at $600. The data module, which supports a single port, is priced at $950. Both products are available now.

Motorola Codex last week brought out a new hardware platform for its 6500 line of packet switches.

The new 6500Plus plat-

(continued on page 23)

GOSIP Version 2

Version 2 contains the same items in Version 1, plus:

- End System to Intermediate System routing protocol
- Virtual Terminal, either simple or forms-capable
- Support for Office Document Architecture in FTAM and 1984 X.400 MHS
- ISDN

Optional:

- Connection Oriented Network Service
- Connectionless Transport Service

SOURCE: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, GAITHERSBURG, MD.
GRAPHIC BY SUSAN J. CHAMPENY

GOSIP version calls for use of untested VT standard

Gov't users unsure of product interoperability.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — The OSI Virtual Terminal requirement added in the second version of the Government Open Systems Interconnection Profile (GOSIP) asks federal agency users to buy products that are not yet widely available and are untested for interoperability.

GOSIP Version 2, which takes effect Oct. 3 (see graphic, this page), calls for the government to buy terminal-emulation products that support two versions of VT — the simple and the forms-capable. Only a handful of vendors have implemented the simple version of VT, and none of them have the forms version available.

> The few vendors that offer simple VT provide it only for specific computer platforms.
>
> ▲▲▲

VT is a terminal-emulation standard intended to enable any terminal to access any host. Simple VT, essentially an OSI version of Transmission Control Protocol/Internet Protocol-based Telnet, supports a dialogue limited to a simple line or character at a time using ASCII character control functions, such as carriage return or back space. Forms-capable VT is intended to support local data entry and supports functions such as field protection, cursor movement and erase screen.

The few vendors that offer the simple version of VT (see graphic, page 23) provide it only for specific computer platforms. Xerox Corp. for instance, offers VT for its own workstations and Sun Microsystems, Inc. workstations, while Retix offers VT for the AT&T 3B2 minicomputer and The Santa Cruz Operation, Inc. Unix platform.

Not all vendors offer both the initiator and responder functions of the client/server-based VT model in which a user initiates a terminal-emulation session and the client responds. For instance, 3Com Corp. has the initiator and responder in its VT terminal server software, but only the initiator was required in its MS/DOS-based personal computer software.

No conformance tests have been created for VT. Subsequently, the National Institute of Standards and Technology has no immediate plans to establish conformance-test certification requirements as it did for X.25, X.400 and File Transfer, Access and Management (FTAM) in GOSIP 1.

Government users seeking assurance of VT product interoperability are turning to such companies as systems integrator J.G. Van Dyke and Associates, Inc. in Annapolis Junction, Md.

Jonathon Gloster, principal systems engineer at Van Dyke and Associates, is tesing OSI products for the Department of Defense. Other GOSIP Version 2 requirements, such as the End System to Intermediate System (ES-IS) routing protocol, are posing no interoperability problems, he said. However, problems in VT applications are still unresolved.

(continued on page 23)

Users may be losing their SNA religion

Recent announcements from two leading router vendors have made leaving the SNA womb easier.

By Michael Cooney
Senior Editor

For many SNA users, the concept of corrupting their SNA network with other protocols was tantamount to heresy.

But recent announcements from bridge/router vendors CrossComm Corp. and Cisco Systems, Inc., coupled with the growth of multiprotocol internetworks, appear to have Systems Network Architecture users warming up to that once-sacrilegious idea.

Over the past few weeks, both companies announced products that address long-standing SNA user concerns about the lack of support in router products for such key SNA features as Class of Service, transmission groups and even Advanced Peer-to-Peer Networking (APPN).

"For Cisco and CrossComm to say they will support everything, including APPN, TCP/IP and other protocols, is an important step," said Lionel Geltman, assistant vice-president of Nomura Research Institute, a financial securities firm in New York.

"SNA users are only dabbling in other protocols," he added. "Most SNA users don't want to introduce another vendor into their net just to provide a piece of their overall network. But, as those [bridge/router] products mature, they become more viable."

Geltman said his firm will con-

(continued on page 20)

GDC introduces pair of new self-adjusting DSUs

By Jim Duffy
Senior Editor

MIDDLEBURY, Conn. — General DataComm, Inc. (GDC) this week will roll out two data service units (DSU) that automatically adjust their operating rates to match the speed of the wide-area links they support.

The DSUs, called the DataComm 500F/AXR and SpectraComm 500A, also detect when transmit and receive pairs have been transposed, and prevent lockup of both local and remote DSUs. The DSUs are targeted at remote and central locations, respectively.

Both DSUs can automatically identify and adjust to any incoming signal rate up to 64K bit/sec, including subrates.

They can also trigger an alarm when the transmit and receive wire pairs have been transposed, which happens frequently when the devices are installed, GDC said.

In addition, the DSUs include a feature, called Extended Dynamic Range, that allows them to receive subrate and 56K/64K bit/sec signals over longer subscriber lines between customer premises and the central office. This capability avoids transmission problems inherent in long lines, GDC said.

The DSUs can also detect and avoid sending a pattern over 64K bit/sec circuits that could cause remote DSUs to go into a loopback. If these patterns are sent, lockup, or stalled transmission, could occur, GDC said.

Both DSUs comply with the V.54 standard diagnostic testing capabilities, including local and remote loop-back and self-test.

The DataComm 500F/AXR is priced at $950. The SpectraComm 500A is priced at $700. Both will be available in October.

Separately, GDC will unwrap, as expected, its Office Communications Manager*Transport Management System (OCM*TMS) multiplexer at this week's 1992 TCA Annual Conference in San Diego.

The OCM*TMS is designed to integrate local-area network, voice, data, facsimile and video traffic at remote locations and funnel it to corporate backbone networks at up to T-1 rates. The OCM*TMS is priced at $4,000 and is available now.

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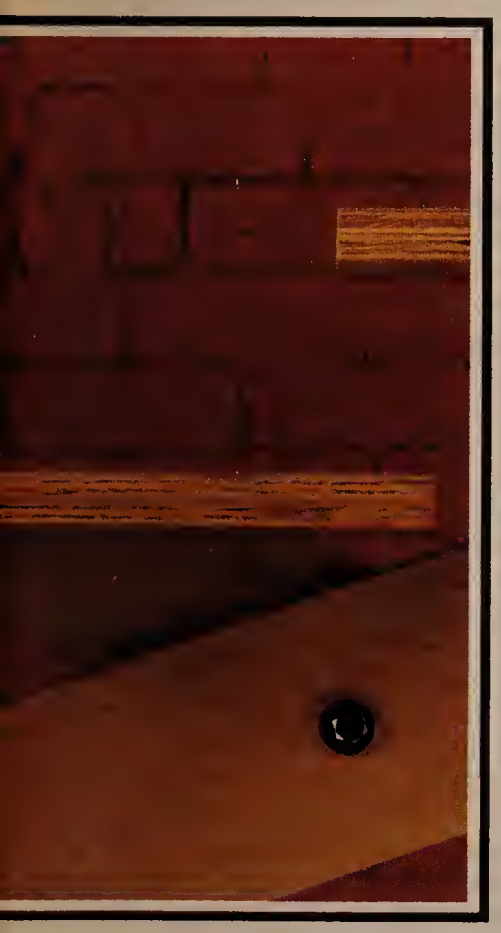

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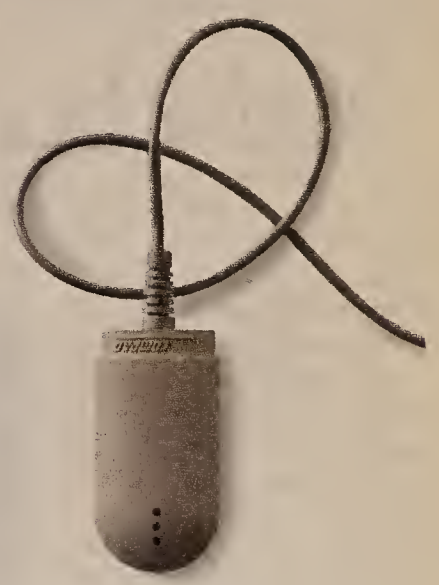

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Spider spins new revs of its OSI, TCP/IP protocol software code

By Jim Duffy
Senior Editor

MARLBOROUGH, Mass. — Spider Systems, Inc. last week brought out an upgraded version of its SpiderOSI software that allows users to exchange network configuration information among different vendors' computers.

The company also rolled out a new version of its Transmission Control Protocol/Internet Protocol software, called SpiderTCP Release 6.0, that supports symmetric multiprocessing, allowing users to link those systems into a TCP/IP network.

SpiderOSI and SpiderTCP are source code versions of OSI and TCP/IP transport protocols for computer and communications vendors as well as systems integrators.

Cabletron Systems, Inc., Digital Equipment Corp., Hewlett-Packard Co., Microsoft Corp. and Sun Micrososytems, Inc. are OEMs of Spider software.

Spider rolled out SpiderOSI Release 3, which supports the Intermediate System to Intermediate System (IS-IS) routing protocol and Connectionless Mode Transport Protocol (CLTP).

IS-IS enables users to exchange configuration and routing information among various types of devices with routing capabilities, including host computers.

CLTP will provide users with a Connectionless Mode Transport Service, meaning data packets will be individually addressed and will not require a virtual circuit to reach their destination.

SpiderTCP Release 6.0 also supports symmetric multiprocessing, meaning users can now use a multiprocessing system to augment or replace multiple uniprocessor servers in a TCP/IP network.

SpiderOSI Release 3 is priced up to $60,000, while SpiderTCP Release 6.0 is priced up to $40,000. Prices for both products, which are available now, are based on how much of the protocol stack is licensed from Spider.

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Users may be losing their SNA religion

continued from page 17

sider the new Cisco and CrossComm products, as well as others, when they become available, to bring its SNA traffic onto one backbone.

Although some SNA users are taking the Cisco and CrossComm announcements with a grain of salt, others see the economic advantages of merging separate multiprotocol LAN internet and SNA backbones and are forging ahead.

One such firm is Allied Signal Aerospace in Torrance, Calif. Mostly an SNA shop a few years ago, the firm has seen the addition of a variety of protocols to its net, including Novell, Inc.'s Internetwork Packet Exchange (IPX) and the Transmission Control Protocol/Internet Protocol.

The company now wants to bring its disparate nets onto a single backbone and is evaluating Cisco and Wellfleet bridge/routers for that purpose.

"I don't see what we're doing as visionary but rather a recognition of reality," said Emanuel Rosales, manager of computing and communications at Allied Signal. "For us, SNA is becoming just another protocol on our network."

Rosales said his major concern about putting the company's SNA data over a router internet is the ability to manage, define and keep track of devices linked to the backbone.

"SNA management products and features provided all of those things," he said.

Cisco, CrossComm and other vendors claim they will be able to address Rosales' concerns. But until SNA users can get their hands on the products and actually work with them, they will continue to be skeptical, said Steve Morgenthal, vice-president of networking for Unified Systems Solutions, Inc. in Mountain Lakes, N.J.

"The traditional SNA customer has their core business applications on the SNA net," Morgenthal said. "That makes them a lot less willing to gamble with technology they see as immature."

On the other hand, he said, router and internetworking technology is now mature enough for corporate network managers to look at it seriously for handling SNA. Additionally, while intracompany politics and the "SNA religion" have kept SNA nets largely pure to date, the economic strain of supporting two or more nets will force a change.

Worth Noting

"It's about time someone freed network administrators from the slavery and bondage of [having to manage] individual servers."

James D'Arezzo
Vice-president of marketing
Banyan Systems, Inc.
Westborough, Mass.
Referring to the way Novell, Inc. NetWare servers are managed today.

Netnotes

Hewlett-Packard Co. of Palo Alto, Calif., last week added Fiber Distributed Data Interface support to its HP 9000 Series 800 family of servers, expanding its existing support for Ethernet and token-ring networks.

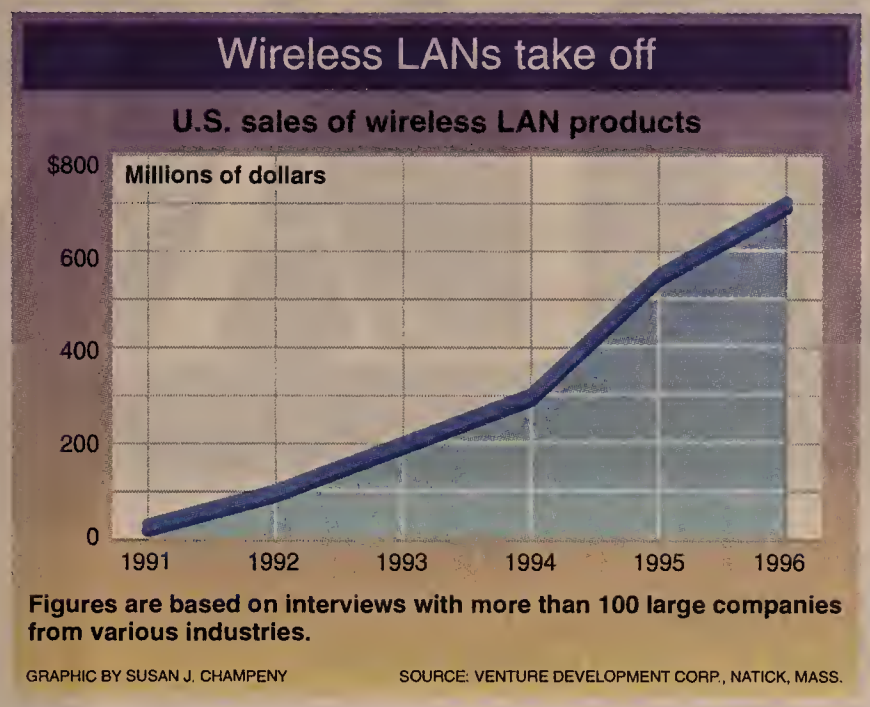
The HP FDDI/9000 for the Series 800 adapter is expected to be available in December. Prices range from $4,495 for a low-end server to $15,995 for a high-end server.

Concord Communications, Inc. this week is expected to bring out a new utility for its Trakker internetwork monitor, called Trak/Report, that will be able to store information in and collect information from an Ingres Corp. relational database.

According to Concord, based in Marlborough, Mass., this capability will let Trakker present a net administrator with a single, combined view of the network, as opposed to its current segment-by-segment view. The utility will also let managers use data from the Ingres database to pose what-if questions, such as to optimize net configuration.

Trakker is software that performs real-time analysis of Transmission Control Protocol/Internet Protocol, Net-

(continued on page 24)



Novell eases LAN-to-host printing with new NLM

Jobs can be sent from host to any printer on LAN.

By Caryn Gillooly
Senior Editor

SUNNYVALE, Calif. — Novell, Inc. last week eased administrators' host-to-LAN printing problems with release of NetWare HostPrint 1.0.

The new product is a NetWare Loadable Module that resides on a NetWare 3.11 server. When used in conjunction with Novell's NetWare for SAA IBM connectivity software, NetWare HostPrint will let a user send a print job from an IBM host to any printer on the NetWare local-area net.

> Previously, host-to-LAN printing was done through a workstation-based emulation product.
>
> ▲▲▲

Previously, host-to-LAN printing had to be done using a third-party terminal-emulation product that had to reside on a dedicated worksation. That method not only required customers to dedicate one or more workstations, but also restricted print jobs to the printers directly attached to those workstations.

In addition, each dedicated worksation could handle a maximum of five simultaneous host sessions. Moving the emulation function to the server eliminates all these restrictions.

"NetWare HostPrint was developed in direct response to customer requests to move IBM 3270 print services to the NetWare server," said Gerry Machi, vice-president and general manager at Novell's NetWare Systems Group, based here.

Packing more power

The new product also offers significantly higher performance for host-to-LAN print jobs because it can take advantage of the speed the 32-bit NetWare 3.11 operating system provides.

Jobs that once took 10 to 20 minutes now take 10 to 20 seconds, said Mary Baade, assistant vice-president of end-user computing at Teachers Insurance and Annuity Association College Retirement Equities Fund, a New York beta site for the product.

In addition, NetWare HostPrint offers as many as 128 simultaneous host sessions, compared to the five available per dedicated workstation with the previous method.

Finally, the server-based product lets the administrator configure sessions, track print jobs, change printing parameters and reset sessions, all from a central location. Previously, each of these tasks had to be done at each individual workstation.

The offering is available now in 8-, 32-, 64 and 128-session packs for $595, $1,995, $2,995 and $4,995, respectively.

Banyan steps into net integrator role

Unveils first of new ENS NOS connectivity line; three-part product ties VINES into NetWare.

By Caryn Gillooly
Senior Editor

NEW YORK — Amid the lights, music and smoke of an impressive laser show, Banyan Systems, Inc., last week revealed its new identity as a system integrator.

At a press conference here, the network operating system vendor took on a new role as it officially unveiled Enterprise Network Services (ENS), a new set of products that will provide enterprise network services to, and connectivity between, multiple network operating systems.

"Customers have hit an integration barrier" with respect to network operating systems, said James D'Arezzo, vice-president of marketing at Banyan, based in Westborough, Mass. "This is the first practical solution toward making enterprise computing more manageable, more available and more democratic."

The first in the new product line is ENS for NetWare, which makes Banyan's StreetTalk directory services, Intelligent Messaging, network management, system administration and security services available to NetWare 2.X, 3.X and 4.0 customers ("Banyan to tie NetWare up with VINES," *NW,* Sept. 14). It will also let NetWare customers access files within VINES environments.

The three ingredients

The three-part product comprises a version of the VINES network operating system without the file and print capabilities, a NetWare Loadable Module (NLM) or value-added process (VAP) to reside on the NetWare server; and a terminate-and-stay resident (TSR) program in each NetWare workstation.

Each VINES server can support as many as eight servers running any version of NetWare, D'Arezzo said, and each TSR takes up less

(continued on page 24)

Rumors surface regarding Macintosh server rollout

By Margie Wylie
Senior Editor

Apple Computer, Inc. is playing it coy in response to reports that it will soon ship a much-needed server for its Macintosh line of PCs.

Without denying reports that the company would ship a Motorola, Inc. 68040-based server in the first half of next year, a spokesman admitted Apple's Enterprise Systems Division is searching for a server platform.

"Apple is currently investigating Motorola's 68000, as well as Reduced Instruction Set Computing [CPUs] as a platform for servers," said Emilio Robles, an Apple spokesman. However, he attributed the reports to the same rumor mill that speculated the Macintosh Quadra, a powerful desktop machine released last year, was indeed the promised server, destined to win Macintoshes more corporate respect.

"It's just the same old rumor that resurfaces about every two months for the last few years," he said.

According to sources, Apple is indeed set to release a number of Motorola 86040-based computers in the first half of next year. However, sporting stereo sound, video in and out ports, and a digital signal processor chip, the most advanced configuration looks more like a high-end desktop machine than a server, according to sources.

The computer is expected to come with a special interface for communications devices, such as modems and Integrated Services Digital Network adapters, and will offer direct memory access (DMA) features — those crucial to I/O speed and, therefore, servers — that might lead users to the same mistaken conclusion about this machine as was drawn about

(continued on page 24)

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Fullerton, CA
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Graybar
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(800) 982-0030

GNWC
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Newark Electronics
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North Supply
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Pacer Telecommunications
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PEPCO
Eastlake, OH
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Fairbanks, AK
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RMES Communications, Inc.
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Van Ran Communication Systems
Doralville, GA
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Vertex
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(516) 293-1610

Wire America/Sentry
Ft. Wayne, IN
(219) 423-2578

Yankee Technology
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Zack Electronics
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(415) 626-1444

AT&T
Network Systems

Data Packets

continued from page 17

form is designed to lower network operating costs and simplify branch office data networking.

The switch includes Flash memory, which lets users remotely download new software to the device rather than manually replace programmable read-only memory.

The 6500Plus is based on dual Motorola MC68302 microprocessors with Reduced Instruction Set Computing technology. It supports dedicated, multidrop, X.25 and frame relay services. Users can increase the capacity of the switch by replacing software and hardware modules.

Pricing for the 6500Plus Asynchronous Access Server with Flash memory starts at $2,075. Pricing for the 6507Plus Multi-Protocol Access Server starts at $2,375, while the 6525Plus Network Concentrator begins at $4,700.

Sync Research, Inc. of Irvine, Calif., last week announced a new low-end version of its SNAC/Token Ring Converter (TRC) device that converts Synchronous Data Link Control packets into 802.2 Logical Link Control 2 (LLC2) frames. The product lets users attach devices such as cluster controllers to token-ring local-area networks.

Dubbed miniSNAC, the new device comes in two- and four-port models supporting a maximum of 16 physical units. The existing SNAC/TRC supports as many as 16 ports and 60 physical units.

Scheduled to ship next month, the two- and four-port miniSNACs cost $3,500 and $5,200, respectively. For more information, contact Sync Research at (714) 588-2070.

GOSIP version calls for untested standard

continued from page 17

Gloster said his company's laboratory is facing difficulties in getting Retix's VT products to work with Data General Corp.'s VT implementation for its AViiON computer line. Configuration default parameters may be the problem, he said, and one that could be resolved through discussion with engineers at Retix and DG.

DG has successfully tested its simple VT product for interoperability with 3Com's VT implementation, said Robin Cohan, DG's OSI product manager.

Retix officials said their VT product interoperates with 3Com's VT offering.

Both DG and The Wollongong Group, Inc. said there has been little demand for simple VT. DG said it is trying to locate source code to create a forms-based product, while Wollongong said it intends to spend its research funds on other projects.

Some think demand for VT will develop thanks to its inclusion in GOSIP 2, but Doug Ambort, Wollongong's product manager for OSI messaging and directory services, noted that GOSIP 1 has apparently not stopped the government from buying non-GOSIP software.

Vendors supplying Virtual Terminal products

Data General Corp.
Westborough, Mass.

Retix
Santa Monica, Calif.

Science Applications International Corp., Open Systems Division
Los Gatos, Calif.

The Wollongong Group, Inc.
Palo Alto, Calif.

3Com Corp.
Santa Clara, Calif.

Xerox Corp., XSoft division
Palo Alto, Calif.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: *NETWORK WORLD*

GOSIP version poses problems

GOSIP Version 2 contains all the requirements of Version 1, but it also specifies additional requirements that, although intended to give users more functional products from which to choose, are also causing some confusion.

The Government Open Systems Interconnection Profile Version 1 listed the X.400 Message Handling System (MHS) in its 1984 version, as well as File Transfer, Access and Management (FTAM). GOSIP Version 2, however, adds that X.400 and FTAM products should support the transport of Office Document Architecture (ODA), the international standard for compound documents.

ODA itself is not a GOSIP requirement, and since there are few ODA products available, only a few vendors have implemented support for ODA in X.400; Unisys Corp. and Xerox Corp. may well be the only two.

Richard desJardiens , director of education at The GOSIP Institute in Fairfax, Va., said ODA is not yet finalized as an international standard profile, and vendors will not implement ODA support until the finished profile is available. Government buyers can still purchase messaging applications conforming to the 1984 X.400 without violating regulations, desJardiens said, although he conceded that those with a hard-line interpretation could argue otherwise.

DesJardiens said he is urging users to consider purchasing the 1988 version of X.400, which includes support for electronic data interchange and other features not available in the 1984 version. The 1988 X.400 will be included in GOSIP Version 3, now being drafted under an effort to combine industry and government requirements into one specification ("OSI spec to spur product development," *NW*, Sept. 14).

Government users are finding X.400 addressing a problem because the addresses were not intended to be entered manually. Rather, they were to be stored in a local or central directory, such as an X.500 Directory Services-based system, desJardiens said. But such directories have not yet been widely implemented.

— Ellen Messmer

Banyan steps into net integrator role

continued from page 21

than 30K bytes of workstation memory. Wide-area communications are provided to NetWare users by encapsulating Novell's Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) protocols into Banyan's routing protocols, he said.

According to Banyan, ENS for NetWare will be available in December. The ENS for NetWare server will cost $3,995.

The NLM and VAP will be available in 5-, 10-, 20-, 50- 100- and 250-user configurations, ranging in price from $295 to $3,495. The TSR, D'Arezzo said, is free of charge.

Only the first

But Banyan last week stressed that ENS for NetWare is only the first in the ENS line, and the company plans to release similar versions to "all your favorite network operating systems," D'Arezzo said. One source said Banyan is already working on the next version, presumably for either Microsoft Corp.'s LAN Manager or IBM's LAN Server, although it could not be determined which one.

Regardless of which version is next, users seemed excited about the ENS line. For those with a mixed environment, the benefits are obvious — ENS can provide the glue to tie together systems that currently cannot work together.

But ENS can provide benefits even for users with all-VINES networks. "The whole concept makes a heck of a lot of sense to us," said Art Beckman, manager of information technology services at Pacific Gas & Electric Co., a San Francisco-based company that uses only VINES local-area networks.

"Sure, a lot of NetWare users will be able to take advantage of Banyan's services, but this opens up the ability for us to put in a few NetWare servers from an applications perspective," he said.

Some applications are written specifically to NetWare or other net operating systems, Beckman said, and VINES customers simply cannot use them. ENS, he said, will give VINES customers access to those applications.

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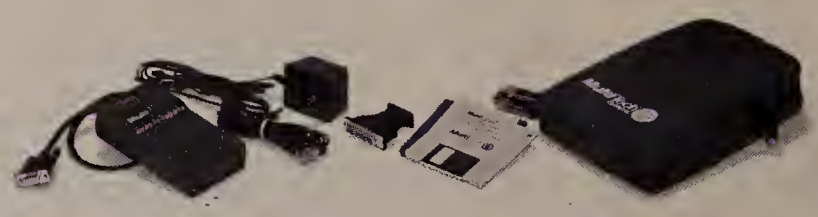

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Circle Reader Service #127

Rumors surface regarding Macintosh

continued from page 21

the Quadra line, the sources said.

Apple's Enterprise Systems Division, which was recently reorganized as a separate profit center under Apple, is conducting its search for hardware out of a group called Servers and Services. The 68040 machines due in the first half of next year will come out of an Apple division commissioned with creating desktop machines, they said.

"We are looking for a differentiating technology that puts Apple above the rest of our natural competitors, mostly those that are making Intel [Corp.]-based server hardware and software," Robles said.

He also hinted that the server, whatever form it may take, will be a complete package that will include software. Apple's current server software, AppleShare 3.0, can run on nearly any Macintosh on a network but does not offer high security, high performance or many of the other features necessary in server software for a corporate environment. Apple officials have in the past hinted they may turn to A/UX, a version of Unix that runs on the Macintosh, as their server software platform.

Netnotes

continued from page 21

work File System and Digital Equipment Corp. DECnet and Local Area Transport protocols. It also offers link-layer monitoring for many protocol suites, including Xerox Corp.'s Xerox Network Systems, Novell, Inc.'s NetWare, Apple Computer, Inc.'s AppleTalk and IBM's PC-Net.

Trak/Report is ready now and costs $7,500.

Acer America Corp. last week brought out the Altos System 15000, the newest member of its Altos line of symmetric multiprocessing servers.

According to the company, based in San Jose, Calif., the Altos System 15000 uses a single, shared system memory accessible by all processors and the Extended Industry Standard Architecture I/O subsystem.

The Altos System 15000 is built around a 64-bit, 50-MHz processor/memory bus with a bandwidth of up to 264M bit/sec. The system board has six processor/memory slots that can support as many as four Intel Corp. 50-MHz i486DX processors or a maximum of four error checking and correction memory expansion boards.

The system is available now, with a base configuration starting at $22,500.

INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

"The rumors that the OSPF interoperability group is limiting membership and meeting behind closed doors are absolutely false. Everyone has a standing invitation to get involved."

Eric Benhamou
President and chief executive officer
3Com Corp.
Santa Clara, Calif.

Link Notes

Advanced Computer Communications (ACC) last week doubled the number of wide-area network ports available on its ACS 4200 and 4400 remote bridge/routers when it introduced a dual-port WAN interface card.

The new card supports two independent serial interfaces, including V.35, X.21, RS-232, RS-422, RS-449 and EIA-530.

The number of WAN ports on the 4200 increases from a maximum of four, with one or two Ethernet or token-ring local-area network connections. The 4000 increases from eight WAN ports to as many as 16, with a maximum of four LAN connections.

The dual-port WAN card is available now and costs $1,500. For more details, call ACC at (800) 444-7854.

At its user group meeting last week, **Wellfleet Communications, Inc.** demonstrated on-line servicing and configuration management capabilities for its Link Node and Concentrator Node bridge/routers.

The features, such as hot swappability and dynamic reconfiguration, were originally
(continued on page 28)

Alantec hub targets users of high-end workstations

PowerHub 5000 supports 12 internal Ethernets.

By Maureen Molloy
Senior Writer

SAN JOSE, Calif. — Alantec today will announce an intelligent hub that provides as many as 76 10Base-T connections over 12 internal Ethernet LANs.

The PowerHub Model 5000 has a bus speed of 120M bit/sec, 12 times the bandwidth of standard 10Base-T hubs.

The architecture of the hub enables it to create essentially multiple, small Ethernet segments in order to help users deal with the surge in powerful workstations running bandwidth-hungry applications. A small group of these devices running applications — such as computer-aided design, image processing or multimedia — can easily saturate an Ethernet.

Like the vendor's existing PowerHub 3000, which can support as many as 12 three-port 10Base-T modules, the newer model integrates 10Base-T hubbing, multiport internetworking and Fiber Distributed Data Interface links.

The hub provides wire-speed bridging and routing between each of its 12 Ethernet and FDDI modules, eliminating the need for stand-alone internetworking devices.

Module support

The PowerHub 5000 supports as many as 8 eight-port Ethernet 10Base-T modules, as well as 4 three-port 10Base-T, 10Base2, 10Base5, or Fiber Optic Inter-Repeater Link/10Base-F Ethernet over fiber-optic cable modules for a total of as many as 76 workstation connections.

"The new model integrates 10Base-T hubbing and multiport internetworking."

▲▲▲

Each module can dedicate Ethernet's full 10M bit/sec bandwidth to a single connection, and the hub supports as many as 12 such connections simultaneously.

That contrasts with typical
(continued on page 28)

Company boosts hub line with added fault tolerance

By Skip MacAskill
Staff Writer

DALLAS — NetWorth, Inc. last week bolstered its token-ring hub line with the introduction of a new module that offers increased fault tolerance.

The company also unveiled a Windows-based Simple Network Management Protocol net management system for its Series 4000 hub that features a graphical user interface (GUI).

The new hub module, dubbed the Series 4000 Token Ring Module (TRM), provides 4M or 16M bit/sec token-ring transmission over voice-grade shielded or unshielded twisted-pair wiring.

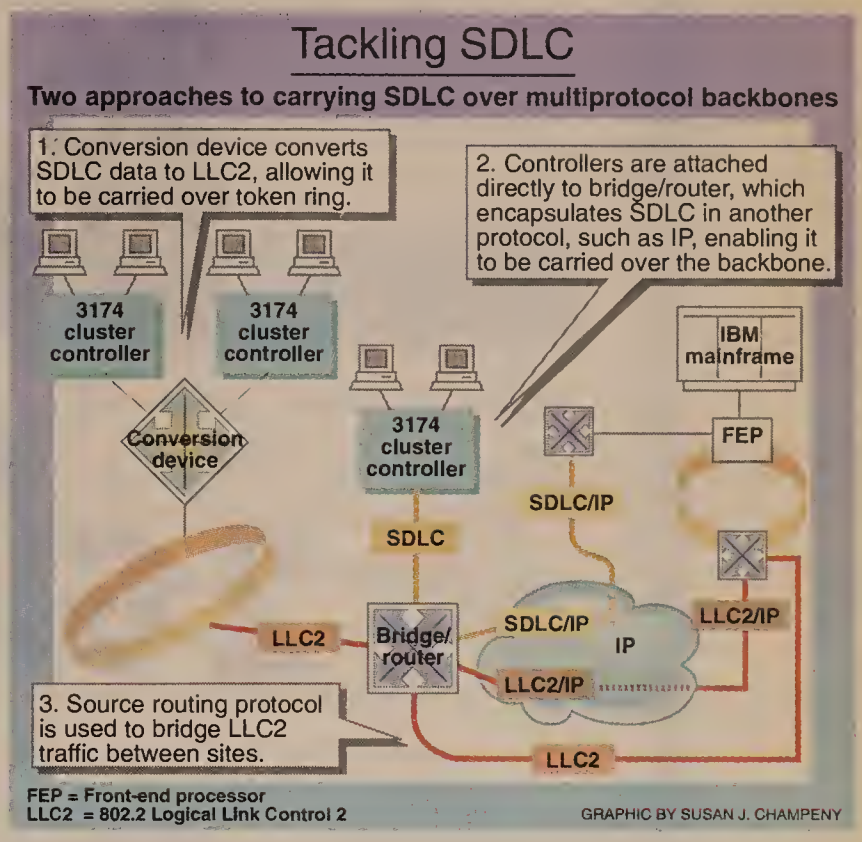
TRM, which fits into either the three-, six- or 10-slot Series 4000 hub, has 12 RJ-45 ports and automatically adapts to the speed of the attached token-ring local-area network.

More help

To increase its fault tolerance capabilities, NetWorth also unveiled an optional daughterboard for the Series 4000 TRM, dubbed the Advanced Fault Tolerance (AFT) card. The AFT employs phase locked loop (PLL) technology and special circuitry to eliminate jitter between ring-in and ring-out ports.

PLL also lets the AFT card automatically detect nodes that are beaconing on the ring. It isolates them by shutting down the faulty port, thereby reducing network downtime.

For further fault tolerance, NetWorth added new retiming
(continued on page 28)



SNA internet issues coming to the fore

Pathway to APPN becomes clearer as internet vendors continue to expound on SNA strategy.

By Bob Brown
Senior Editor

With recent SNA routing announcements from Cisco Systems, Inc. and CrossComm Corp., the migration path that bridge/router vendors are taking toward IBM's Advanced Peer-to-Peer Networking (APPN) scheme is becoming more clear.

While APPN is the ultimate goal for nearly all the vendors, their routes to it are not quite the same. For example, bridge/router vendors are taking different tacks toward getting IBM Synchronous Data Link Control traffic onto a multiprotocol backbone, although most agree on the importance of giving Systems Network Architecture traffic the priority it requires and are rolling out enhancements that address that issue.

Additionally, Cisco has proposed an alternative and intermediate step to APPN dubbed Advanced Peer-to-Peer Internetworking (APPI) for which at least two other router vendors have already voiced support ("Cisco challenges IBM peer-to-peer net plan," *NW*, Sept. 7).

Such a phased APPN migration approach makes sense, analysts said, because APPN is such a complex technology.

"A migration has to happen," said Todd Dagres, director of data communications research at The Yankee Group, a market research firm in Boston. "For the most part, with the exception of CrossComm and maybe Proteon [Inc.], you have router vendors coming from the Ethernet and IP worlds that are trying to round off a square SNA peg and fit it into a round IP hole. They won't have a round peg until APPN comes along, so there's no use rushing things."

The gradual move to APPN also makes sense for users, who are being cautious about moving their deterministic SNA traffic onto a multiprotocol backbone, even if they will be rewarded with reduced wide-area line costs.

"Most companies that are considering merging their SNA and LAN backbones are still at the pilot stage," said David Passmore, a program director and vice-president at Gartner Group, Inc., a Stamford, Conn., market research firm. "It's going to take features like SDLC conversion, Class of Service and APPN implemented in reliable software to get them actually moving beyond the pilot stage and running live SNA applications across their multiprotocol backbones."

One of the first steps in that
(continued on page 88)

HUGHES SPACE AND COMMUNICATIONS GROUP—INTERNATIONAL TELEVISION SATELLITE SERVICES • CABLE TELEVISION SATELLITE SERVICES • VSAT NETWORKS

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Getting more performance from less hardware is the idea. With over 2 Gbps of bandwidth, the Enterprise Hub makes the idea reality.

Now you can add, segment and redefine new networks on the backplane. Forget about stacking

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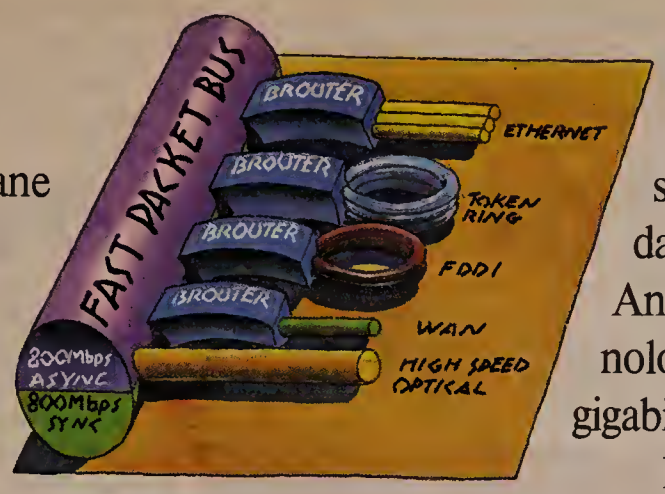
hubs. Instead, the Enterprise Hub's segmented backplane lets you integrate and internetwork multiple Ethernet, Token Ring and FDDI LANs all within the same hub.



The Enterprise Hub's segmented backplane architecture allows incremental expansion of your network to utilize over 2 Gbps of bandwidth.

When you want to move users around the network, there's no need to navigate your way through various wiring closets. Thanks to the Enterprise Hub, reconfiguration is easily handled from your network management station.

STEER CLEAR OF TRAFFIC.

Segmented hubs have become the network's highway system. So integrating bridges and routers within the hub makes perfect sense. However, that can result in the type of backplane traffic that resembles rush hour in L.A.

The Enterprise Hub provides an express lane to speed traffic through. Its high speed bus architecture offers 1.6 Gbps of throughput. Because the bus is cell-based, it supports high speed hardware switching in both asynchronous and synchronous datastreams. And when technologies like gigabit hub-to-hub links and ATM interfaces are ready, your hub's ready for them.

MORE INTELLIGENT MANAGEMENT.

There's nothing too smart about expanding your network to the point where it grows beyond your control. Here again, the Enterprise Hub is the intelligent choice.

Dedicated SNMP processors reside on every module in the hub. So you always have easy access to the information you need. And every time you add a module, you also add network management processing power.

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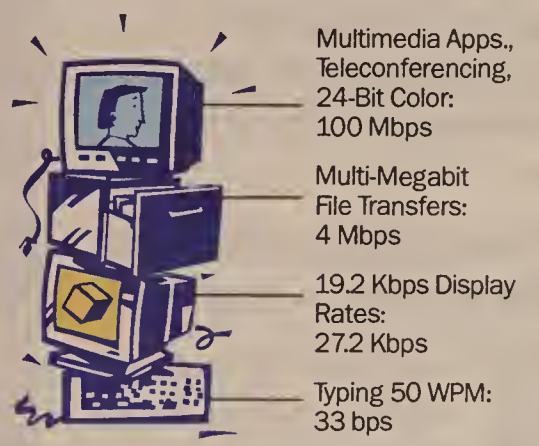
THE BIG PICTURE.

Even if you're focused on your company's current needs, experience has taught you enterprise networking needs are unpredictable. So the hardware investments you make today should pay dividends for many years.



In the future, as complex applications demand greater bandwidth, the Enterprise Hub gives network managers the flexible architecture they need to make migration simple.

It's time to think big. Look at the Enterprise Hub's 2 Gbps bandwidth versus your typical hub's 10 or 20 Mbps. You'll find a huge difference in terms of performance. But in terms of price, you'll find the difference little to none. Call **1-800-395-5267** for more information about the Enterprise Hub and Hughes LAN Systems' big picture networking solutions.

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Circle Reader Service #131

Firm boosts hub line with fault tolerance

continued from page 25

technology to each TRM to eliminate jitter at both the port and module level.

Both the TRM and AFT are managed by NetWorth's Token Ring Services Agent, a set of NetWare Loadable Modules that run on the firm's NetWare Application Engine (NAE). The NAE was developed with Novell, Inc. to let NetWorth hubs run certain NetWare applications ("Vendor trio positions hubs as LAN servers," *NW,* May 11).

The Services Agent collects all ring statistics and information and reports them to any third-party SNMP-based net management system, including NetWorth's new SNMP-based net management system, dubbed HubView.

Management help

HubView is software that runs on a DOS 5.0 or Windows 3.0 and requires a 386, 486 or IBM Personal System/2 computer. It provides management for NetWorth's Ethernet and token-ring devices.

Its features include full Management Information Base I and II support, SNMP alert notification, a GUI that supports customized network maps and configurations, and the ability to restrict network access to certain users.

TRM will be available in November for $1,795.

AFT and the Services Agent are expected to ship in January and are priced at $995 and $495, respectively.

HubView will be available in October and will cost $2,395.

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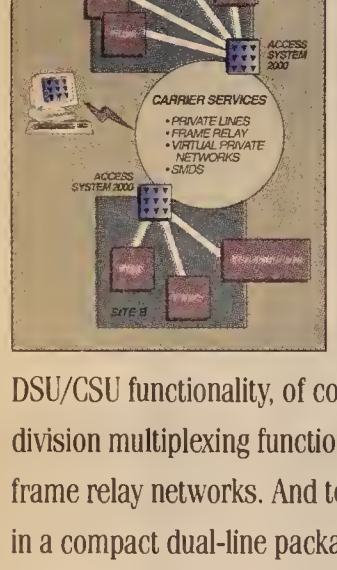

Access System 2000 is designed to effectively deal with changing technologies in communications environments notorious for short product life cycles. It gives you intelligent T1 and fractional T1 interfaces, as well as high and low speed digital applications interfaces. There's DSU/CSU functionality, of course. And T1 and subrate time-division multiplexing functionality. You get access to today's frame relay networks. And tomorrow's SMDS networks. All in a compact dual-line package. Or a multi-line, multi-port model that optimizes operational flexibility and expansion.

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See Us At TCA Booth #1116

Circle Reader Service #119

Alantec hub targets high-end users

continued from page 25

10Base-T hubs that let all attached workstations contend for the 10M bit/sec bandwidth.

The new hub is also equipped with two optional 100M bit/sec FDDI modules, each of which can be configured to support a single- or dual-attached link, such as to a work group server or an FDDI backbone.

The PowerHub 5000 will be shown at NetWorld 92 in Dallas and at INTEROP 92 Fall next month. It will begin shipping in November and is priced at $27,950, or about $368 per port. The FDDI modules are priced at $9,950.

For more information, contact Alantec at (408) 955-9000.

Link Notes

continued from page 25

announced for Wellfleet's gigabit speed Backbone Node bridge/router. But last week, the company said it will also make them available on its older gear, providing users of those devices with greater redundancy and higher availability.

Cisco Systems, Inc. last week announced it has signed an OEM agreement with Alcatel N.V., effective immediately, wherein Alcatel will resell Cisco's complete internetworking product line.

Although the contract will allow the company to sell Cisco products on a worldwide basis, Alcatel expects to concentrate sales in Europe, where the company currently holds a significant share of Europe's telecommunications and data communications markets.

Shiva Corp. and **Tribe Computer Works** have announced the availability of a specially priced internetworking package that includes Tribe's 16-port LocalSwitch packet-switching hub for Macintosh networks and Shiva's FastPath 5R rack-mountable LocalTalk-to-Ethernet gateway.

The offer, available now through resellers nationwide, lasts through October. The package price is $3,999, whereas the products cost $6,294 if purchased separately.

For more details on the offer, call Shiva at (800) 458-3550 or Tribe at (510) 547-7800.

Hughes LAN Systems, Inc. last week announced it has been awarded a $7.4 million network integration contract from the Government Services Administration for the Social Security Administration's Office of Hearing Appeals (OHA). The contract involves the installation, linking and support of more than 150 token-ring local-area networks throughout OHA offices nationwide.

Synernetics, Inc. last week unveiled a single-mode fiber option for its LANplex 5000 switching hub that can extend the distance between hubs from the standard 2 km to more than 14 km.

The single-mode fiber interface, which is available on both its Fiber Concentrator and Enterprise Access hub modules, costs $4,500 per port and is available now.

Banyan now offers two ways to get enterprise-wide networking.

Traditional.

For years, the world's largest enterprise networks have run on Banyan VINES.® Banyan is the leader in enterprise-wide PC networking.

Others try, but none can equal our ability to integrate PCs, minicomputers and mainframes.

This is because VINES was built for the enterprise—not the workgroup. Our enterprise network services are unified for a single system view, creating a network that is infinitely easier to use and manage.

In fact, independent research shows VINES is also the most cost-effective network.

Indeed, no matter how large your VINES network becomes, expense will always be held to the barest minimum.

This effortless expansion is made possible in part by StreetTalk,® the industry's best global directory, plus enterprise-wide services such as administration, security and messaging, which speeds and streamlines network tasks, making network managers far more productive.

Field-proven and perfected over nine years, VINES is a critical component of some of the world's largest computer networks. And is used by nearly two million eminently satisfied people.

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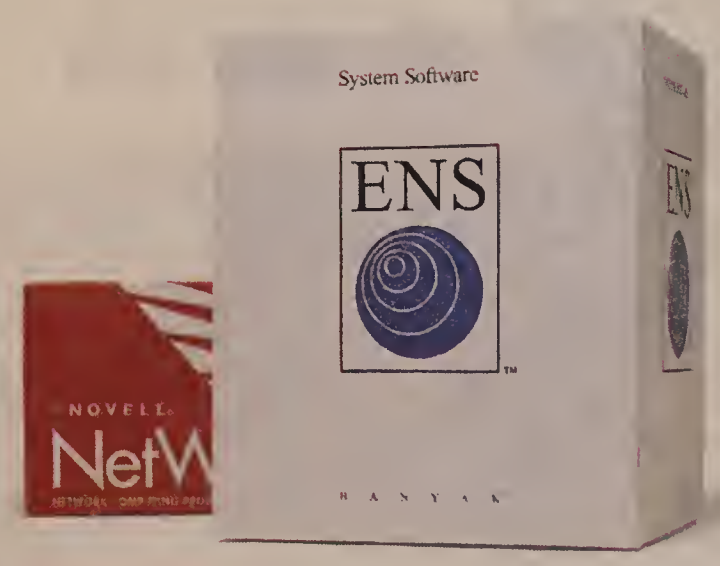

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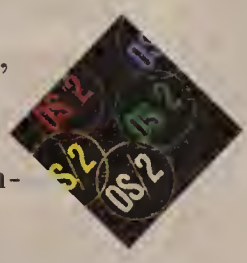

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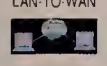

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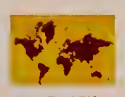
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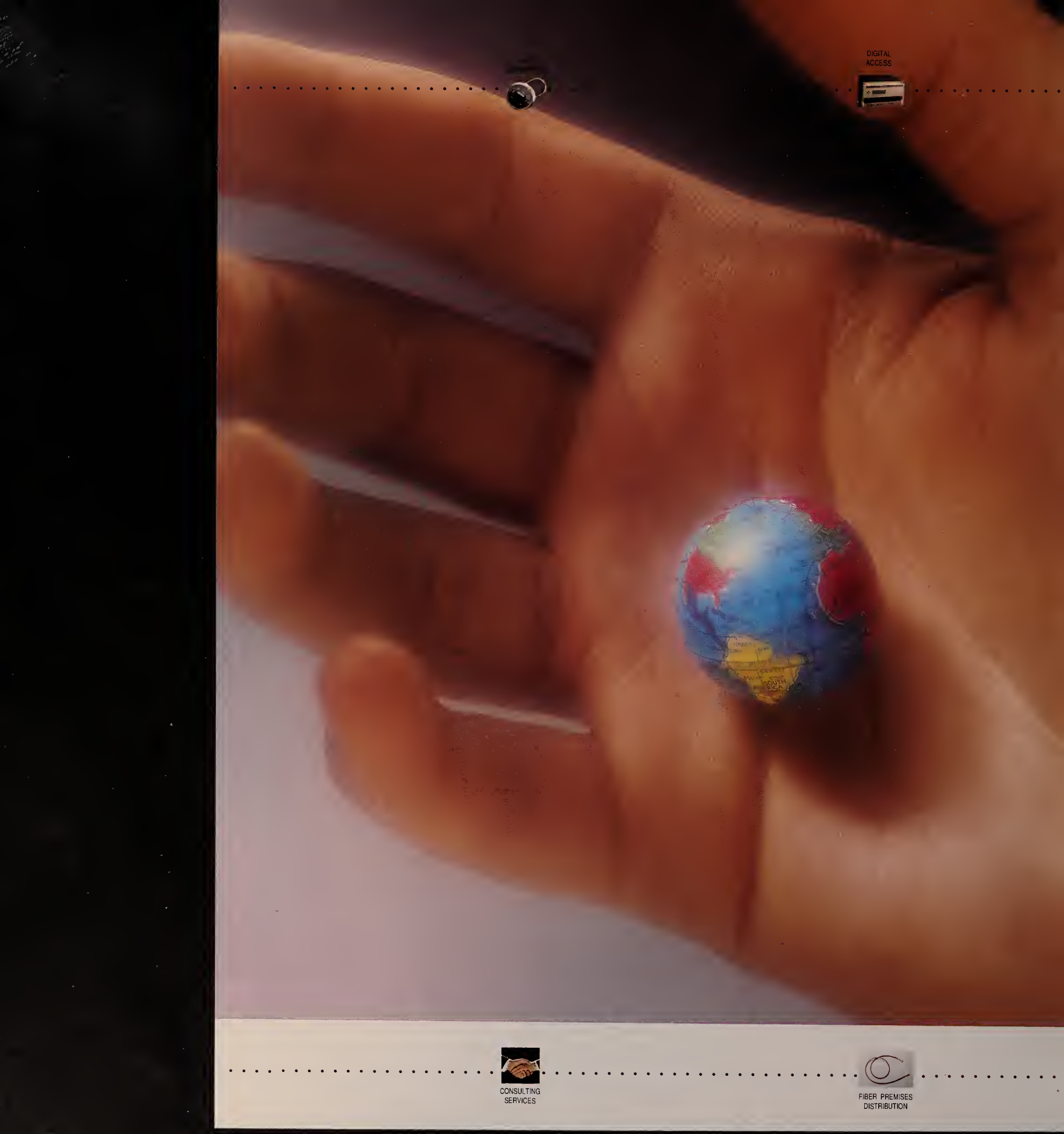
T1 AND E1 SYSTEMS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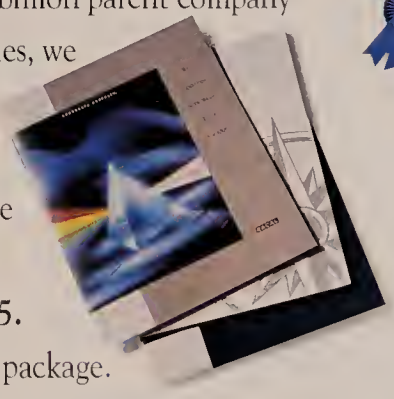

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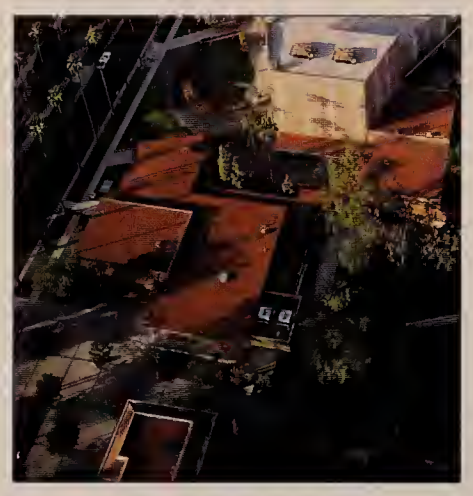

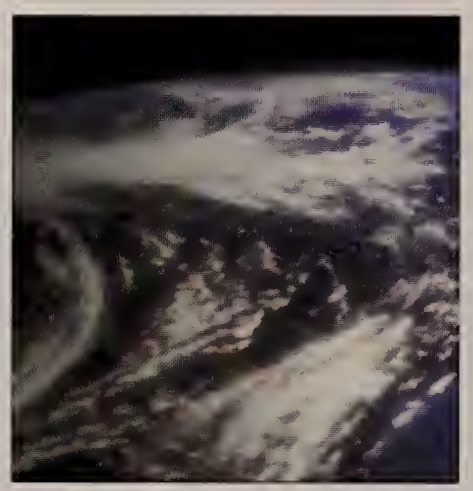

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Worth Noting

"We have yet to see a hockey stick-like increase in demand for public frame relay service. Interest is building rather slowly."

William Pfeiffer
Senior vice-president
Sprint Data Group
Kansas City, Mo.

Regulatory Update

The **Federal Communications Commission** last week released details about a hearing it will hold on toll fraud in October. The hearing, which is scheduled for Oct. 9, will include expert witnesses from carriers, law enforcement agencies, equipment manufacturers and the International Communications Association (ICA).

Lawrence Gessini, manager of telecommunications for Agway, Inc., a major farm cooperative based in Syracuse, N.Y., will represent the ICA. Gessini said he will attempt to communicate the impact toll fraud is having on users based on the results of an internal survey the ICA has conducted and is currently compiling.

"Very few major corporations [including Agway] have escaped toll fraud," Gessini said. Tariffs are ambiguous about who should be responsible for liability of fraudulent charges, he claimed, adding that there is some justification for the liability to be shared.

Pacific Mutual Life Insurance Co. has proposed that the FCC set up such a liability sharing arrangement. The idea is to split fraudulent charges among users, carriers and telecommunications equipment manufacturers, all of whom have some control over

(continued on page 54)

MCI charges AT&T with using unfair discounting

Says competitor favors some users over others.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — In a formal complaint filed at the FCC last week, MCI Communications Corp. accused AT&T of illegally favoring some customers with discounted service packages while attempting to keep them from other users.

MCI was complaining about the new contract deals that AT&T was allowed to begin offering this year. AT&T has filed 28 such contract deals since May for a wide variety of services, including private lines, as well as virtual network and switched services.

MCI and Sprint Corp. have filed objections to virtually every contract deal, claiming that AT&T includes so many restrictions that the deals cannot possibly be used by more than one customer. The carriers also say AT&T is intentionally attempting to limit the number of customers that receive its contract deals, which typically offer deeply discounted prices.

All of AT&T's contract deals have restrictions on the number of days in which the deal can be ordered. Typically, users are given 90 days to order the deal. Some deals also contain limits on the number of sites from which traffic can originate, network configuration requirements and revenue commitments.

In its complaint last week, MCI said such restrictions are an attempt by AT&T to fence in its contract offerings so that only certain customers can purchase them. "Tariff provisions and marketplace practices that serve to unreasonably limit or deny the general availability of its offerings are unlawful under the Communications Act of 1934 and cannot be tolerated by the commission if it expects to nurture development of an effectively competitive interexchange telecommunications marketplace," MCI stated in its complaint.

MCI and Sprint have both claimed in previous objections that AT&T's contract deals are illegal on two counts. First, they say that such restrictions violate provisions of the Communications Act that prohibit AT&T from discriminating among customers. They also say the restrictions in contract deals violate requirements in the act that common carriers such as AT&T cannot refuse to sell service to any customer.

Last week, MCI stepped up its objections with the formal complaint. Previously, MCI had filed petitions asking the Federal Communications Commission to reject the contract deals during its normal review process. However, the FCC has allowed 21 of the 28 deals to take effect, MCI said.

The FCC always dismisses the petitions against the contract deals by saying that the deals do not obviously conflict with statute or agency regulation, according to MCI.

This treatment has left unanswered the question of whether AT&T's establishment of periods by which the service has to be ordered, as well as other restrictions, may be unlawfully discriminatory. AT&T's other major vehicle for custom deals, Tariff 12, does not include these so-

(continued on page 34)

Rockwell intros call processing offering

Spectrum system provides integrated features for small and midsize call processing centers.

By Bob Wallace
Senior Editor

NEW YORK — Rockwell International Corp. last week announced what it says is the first call processing product that integrates automatic call distributor (ACD), voice processing, outbound call management and PBX features in a single switching system.

Spectrum provides call handling for users with between 25 and 400 agent call centers, a market that Rockwell admitted it has been unable to serve with its high-end Galaxy ACD since it was introduced 19 years ago.

Spectrum comes with an Integrated Services Digital Network Primary Rate Interface that lets the switch access network services and an ISDN Basic Rate Interface that lets it support attached customer premises equipment such as agent telephones.

The system enables call center managers to establish incoming call routing procedures — called Telescripts — for as many as four agent groups. Each group can serve as a secondary group for a main agent group.

Telescripts can also be used to route calls to informational announcements, voice response units or ACD Mail, all of which allow callers to leave voice messages for callbacks.

The routing can be based on the trunk group on which the call arrived; dialed number identification service (DNIS), which is the last four digits of an 800 number dialed; or automatic number identification. Telescripts also dictate procedures the switch should follow if all agents are busy and there is a sizable delay in answering calls.

Agent availability is determined by their current work activity as well as by agent-controlled call availability status indicators, which are dynamical-

(continued on page 54)

Top carriers testing voice recognition

Second of a two-part article.

By Christopher Finn
and Daniel Briere
Special to Network World

Although Sprint Corp. is the only carrier publicly trialing a telephone calling card that supports voice-activated commands, it is not the only company investigating the benefits of the technology and may not be the first to introduce a product for general availability.

AT&T Bell Laboratories has been researching and developing voice recognition technology for more than 30 years and is internally testing a calling card product, while MCI Communications Corp. has a test in progress with 1,000 employees.

"AT&T has plans to test a pilot card and may release a commercially available, voice-activated card by the end of the year," said Rachelle Rosenberg, an AT&T spokeswoman.

AT&T recently demonstrated a real-time automated spoken language translator at Expo '92 in Seville, Spain, and has implemented a version of this system in that country.

The carrier also markets a version of its Conversant voice information system with voice recognition capability.

"There is a critical moment in the life of a new technology when it suddenly catches on," said Bishnu Atal, head of the speech research department at AT&T Bell Labs. "We are at that moment for speech recognition in the telephone network."

Callers without the new AT&T voice-activated calling cards will start encountering the technology, as well, but in a different way. AT&T is using voice recognition systems to interpret simple commands such as "collect call" and "person-to-person" in its efforts to automate labor-intensive operator service functions.

(continued on page 50)

Teleos introduces low-end inverse mux, launches trade-in program

By Bob Wallace
Senior Editor

EATONTOWN, N.J. — Teleos Communications, Inc. has announced a low-end inverse multiplexer, along with a trade-in program that enables users to swap competing devices in exchange for discounts on the new Teleos machine.

It also rolled out new cards for its existing inverse muxes that quadruple the number of net trunks the devices can support.

The new device, dubbed the NetworkHub Model 40, supports the proprietary Teleos Inverse Multiplexing protocol and a protocol developed by the Bandwidth-On-Demand Interoperability Group (BONDING). Both are schemes for inverse multiplexing, a process by which the device synchronizes multiple switched or leased circuits to form a single, larger pool of bandwidth.

Teleos' announcement comes on the heels of rival Ascend Communications, Inc.'s introduction of a low-end inverse multiplexer ("Ascend fleshes out its inverse mux line," *NW,* Aug. 31).

Model 40 supports RS-366, a dialing method used for domestic videoconferencing, and will support X.21 — which can be used to support international videoconferences — in the first quarter of next year.

The vendor offers a Microsoft Corp. Windows-based package for managing its entire inverse mux line. Users will be able to employ the package to point and click to any of the 999 telephone numbers stored in a personal computer running Windows.

Model 40, a Motorola, Inc. 68020-based unit, can support as many as eight network trunks. It can use T-1, Integrated Services Digital Network Basic Rate Interface (BRI) and ISDN Primary Rate Interface (PRI) to access switched and dedicated services.

Switched offerings supported include Nx56K, Nx64K, switched 384K, switched 1.536M bit/sec and multirate ISDN services, while dedicated services include fractional T-1 and T-1.

Model 40's host I/O modules support V.35, RS-449, token-ring, T-1, BRI and PRI interfaces.

Teleos also announced four-port trunk cards that can be used to replace its existing single-port cards. This will enable the Model 40 to support eight T-1s, the mid-range Model 60 to support 16 T-1s and the high-end Model 200 to support 72 T-1s.

Trade-in offer

The company is the first in the industry to introduce a limited-time offer under which it will give users trading in a rival's inverse mux a credit toward the purchase of a specially configured Model 40.

Companies that use Ascend's MultiBand and MultiBand Plus, Digital Access Corp.'s FracDial, Newbridge Networks, Inc.'s TAP5000 and Promptus Communications, Inc.'s Oasis inverse multiplexers will receive a $1,000 credit toward the purchase of a $9,995 Model 40, including one T-1 or PRI network access card and one dual-port V.35/RS-366 card.

There is no limit to the number of units that can be traded in for the Model 40. Users receive one credit per Teleos mux. The offer expires at year end.

Model 40 is available now and ranges in price from $7,500 to $12,000, depending on configuration.

MCI claims AT&T discounting unfair

continued from page 33

called ordering windows.

MCI has apparently decided to step up its objections to the contract deals by filing this formal complaint.

Complaints such as this are handled much like a court case would be, with both sides entitled to force the other to produce documents and make officials available for testimony.

MCI's complaint zeroed in on AT&T's 21st contract deal as an example of the problems created by restrictions. That deal contains a 90-day ordering window and specifies that the customer commit to charges of $85,729 per month, which could drop to a minimum of $35,000 per month over the five-year life of the contract. It also requires at least 75% of all Accunet Spectrum of Digital Service be configured as two-point service.

MCI is asking the FCC to force AT&T to remove the ordering and installation windows from existing contract deals and prevent such restrictions in the future.

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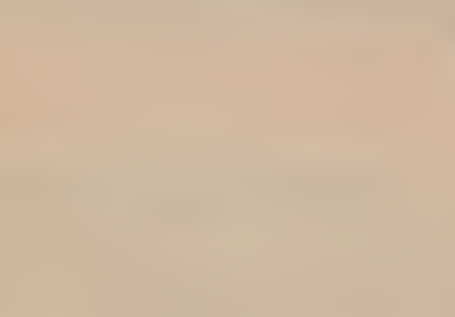
The inspiration behind the IBM 4033 LAN



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IBM LaserPrinter 10	IBM 4033	141.6 seconds	21.8 seconds	268.3 seconds

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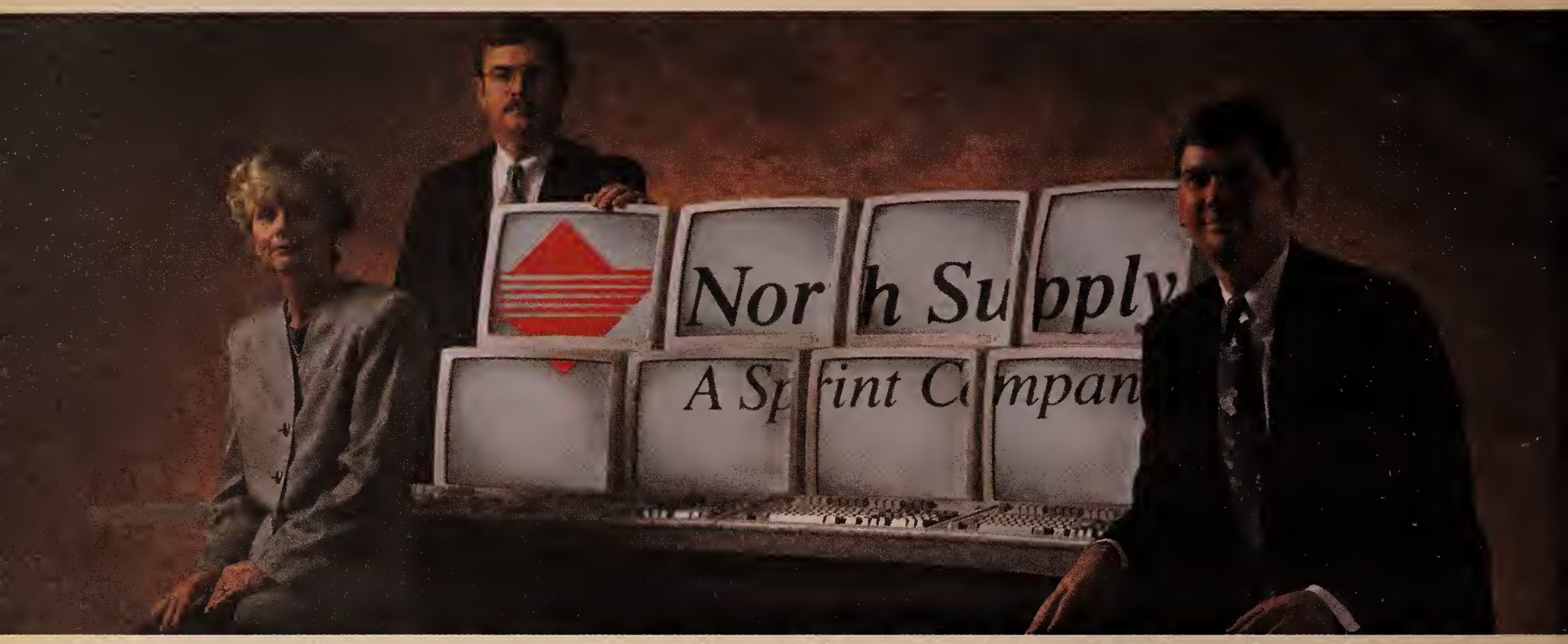

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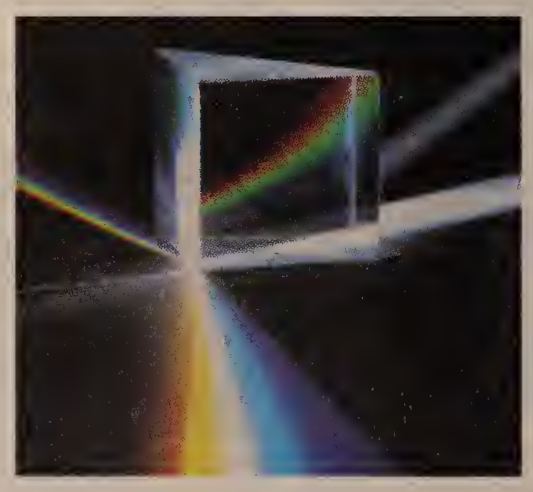

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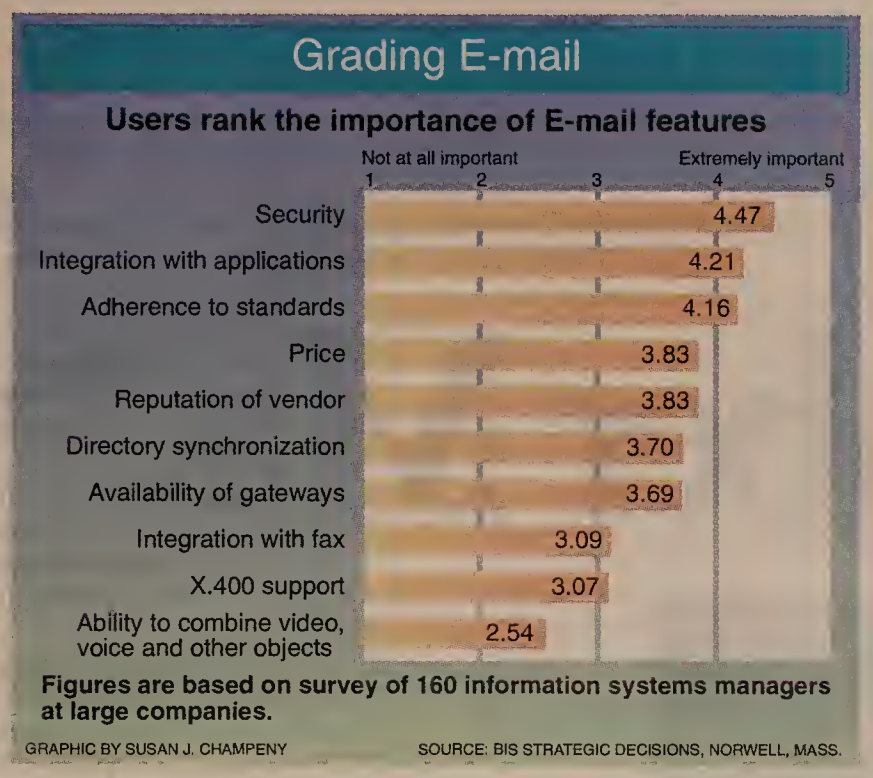
Cooperative Solutions, Inc.
San Jose, Calif.



Ellipse/PS system boasts Unix support

Environment helps developers build apps based on Unix servers with Windows and OS/2 clients.

By Timothy O'Brien
West Coast Bureau Chief

SAN JOSE, Calif. — Cooperative Solutions, Inc. last week announced the Ellipse/Production System (PS) for Unix, a version of its multiuser development environment that helps users build client/server applications based on Unix servers with Windows or OS/2 clients.

Adding Unix support — the company already supported OS/2 at the server — gives users a scalable, high-performance server platform for mission-critical local-area network-based applications.

"The new product allows developers to create robust, production quality applications using a widely implemented client environment — Windows — with a widely used server operating system — Unix," said Dennis McEvoy, president and chief executive officer of Cooperative Solutions, based here.

Ellipse, a multiuser LAN-based development environment, emulates the functions of mainframe-type development systems. It supports project-team development, testing and maintenance of client/server applications.

Ellipse applications can work with database servers such as Sybase, Inc.'s SQL Server, Microsoft Corp.'s SQL Server and Oracle Corp.'s Oracle Server.

McEvoy said Ellipse aids users that want to move host applications to a client/server platform but lack skills in distributed applications and building systems that work with graphical user interfaces or Unix.

The Ellipse system automatically determines the optimum way to split an application between the client and the server. It also provides typical "life cycle management" services and features that aid in multisite deployment of distributed applications.

(continued on page 40)

Start-up targets desktop videoconferencing arena

Intros multimedia pack for business conferencing.

By Wayne Eckerson
Senior Editor

MECHANICSBURG, Pa. — Start-up InSoft, Inc. has jumped into the nascent desktop videoconferencing market with a new version of its business conferencing software.

Communique Version 2.1 supports full-motion color video and works with Parallax Graphics, Inc.'s XVideo board, which lets Communique users conduct multipoint videoconferences via desktop workstations. The XVideo board supports 24-bit video and Joint Photographic Experts Group (JPEG) data compression across local- and wide-area networks.

Communique is multimedia conferencing software that runs on Sun Microsystems, Inc. SPARC workstations and Solaris 1.0, in addition to higher operating systems, and works across Transmission Control Protocol/Internet Protocol networks.

Besides videoconferencing and audioconferencing, the software lets multiple users view and mark up an image or text file across a network and automatically see any changes made to the document.

The software runs in a single window within Sun's OpenWindows graphical user interface (GUI). Users can work on a spreadsheet at their desks while simultaneously participating in a Communique business conference. Moreover, users can capture a portion of the spreadsheet on their screen and drop it into Communique's white board application so that all videoconferencing participants can view it.

Communique comes with a set of tools, similar to Apple Computer, Inc.'s MacPaint tools, that allow users to mark up a shared image, which is in raster format, while shared text files are in ASCII format. Communique supports a GUI and is icon-driven.

Communique videoconferences require 56K bit/sec of bandwidth, according to Dan Harple, president of InSoft. However, users running Communique without the videoconferencing or audioconferencing features can use 9.6K bit/sec or higher connections.

The Parallax video card transmits video signals at 30 frame/sec, but when used with Communique, it transmits between 28 and 30 frame/sec because of overhead, according to InSoft. Television-quality video runs at 30 frame/sec.

The video card comes with an attachment that allows users to adjust the level of JPEG data compression. Increasing compression levels reduces the amount of network bandwidth consumed but reduces image clarity, Harple said. Also, users can reduce bandwidth consumption either by closing one or more videoconfer-

(continued on page 40)

Store & Forward

Verimation, Inc. last week announced Memo/EDI, which enables the firm's other groupware applications, such as Memo/Forms, to use electronic data interchange facilities to exchange information.

For example, users can create electronic forms in Memo/Form that are sent through Memo/EDI to a customer or supplier site, providing a faster response time for processing orders or shipments than using through conventional ordering procedures.

Memo/EDI, available now, runs on under IBM's MVS operating system. It is priced at $30,000 for unlimited users.

Verimation also introduced Memo/Bulletin Board, an electronic information-sharing facility that stores standard Memo messages as well as non-Memo format files. Available now, it also runs on MVS and costs $10,000 for unlimited users.

Recently, Verimation introduced a local-area network version of Memo. No details were available on when LAN versions will be available.

Leading X.400 software supplier expands reach

By Wayne Eckerson
Senior Editor

LONDON — Data Connection Ltd., a leading supplier of X.400 software to original equipment manufacturers, last week told *Network World* it plans to begin marketing its X.400 messaging system to large U.S. corporations. In addition, the company, based here, revealed that it is supplying components of its Data Connection (DC) X400 software to Microsoft Corp. for its soon-to-be-announced Enterprise Message Server, which runs under Windows NT.

DC X400 runs on Unix and OS/2, as well as some proprietary server platforms, and conforms to the 1988 version of X.400 and the Government Open Systems Interconnection Profile (GOSIP) 3.0 standard.

The software supports a message transfer agent, a message store utility, an OSI protocol stack, electronic mail and network management applications, and diagnostic and administrative functions.

John Cooper, director of OSI at Data Connection, said DC X400 is a scalable X.400 product that works equally well as a work group message server and a high-volume message backbone.

For the past several years, Data Connection has sold components of its X.400 technology to OEMs in the U.S., such as Hewlett-Packard Co., IBM and NCR Corp., but has never marketed the product directly to users.

The move to sell X.400 to users will place Data Connections in direct competition with Retix, the leading U.S. supplier of X.400 software.

Cooper said Data Connections will be able to compete effectively against Retix and other X.400 product suppliers because of its

(continued on page 39)

Ellipse/PS system boasts Unix support

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Applications built with Ellipse are portable across a wide range of environments, including Windows, 02/2 and Unix. Windows NT and Novell, Inc.'s NetWare will be supported until next year, so users will be able to move existing applications to those environments.

"The battle for the application server operating system has not even begun yet," McEvoy explained.

The initial release of Ellipse/PS for Unix, which will be available this month, will run on Sun Microsystems, Inc.'s Sun/OS but will provide access to databases running on many other Unix platforms, including IBM's RISC System/6000, Hewlett-Packard Co.'s HP 9000 and Digital Equipment Corp.'s Ultrix.

Ellipse/PS for Unix is the first in a series of Unix products scheduled for release by Cooperative Solutions. In the future, the company is expected to provide details on other Unix environments to be supported in 1993.

Start-up targets desktop arena

continued from page 39

encing windows in a multipoint session or decreasing the size of individual windows.

InSoft, which was founded two months ago, already has 60 customers, most of which have yet to implement Communique's videoconferencing components, according to Harple. Most are using Communique to simultaneously view, discuss and mark up shared images or ASCII files.

Harple added that Nynex Corp. and a large consortium of law firms have purchased the Parallax video card and will soon conduct multipoint videoconferences using Communique.

"It looks promising, but the market is still young, and we have not seen all the players yet. And price is still an issue," said S. Ann Earon, president of Telemanagement Resources International, Inc., a management consulting firm in Lake Wylie, S.C.

InSoft will be demonstrating Communique at Unix Expo next week in New York, and the software will be a featured application within INTEROP 92 Fall's Fiber Distributed Data Interface showcase next month in San Francisco. At INTEROP, there will be Sun SPARC workstations in three booths running Communique multimedia videoconferences across an FDDI network.

InSoft plans to port Communique to Hewlett-Packard Co.'s Unix processors running HP-UX in the near future. It also plans to support Tagged Image Format Files on its white board application, Harple said.

Communique Version 1 supports Sun's VideoPix board, which provides black-and-white video transmission at five to eight frames per second. Pricing for Version 1 is $995 per seat and $4,500 for a five-seat package. The VideoPix card costs $719.

Communique Version 2.1 costs $1,295 per seat, and the Parallax card costs $7,490 per workstation.

X.400 software supplier expands

continued from page 39

reputation for high-quality engineering and customer service and support. The firm has never marketed its OSI products to OEMs and has done relatively well by relying on word of mouth, he said.

Judith Rosall, electronic messaging program manager for International Data Corp. in Framingham, Mass., said, "X.400 technology is not simple, and most companies will need the support that Data Connections offers. Few X.400 vendors will be able to compete against that."

According to David Ferris, president of Ferris Networks, a San Francisco research and consulting firm specializing in personal computer networks, "Data Connections will give Retix a good run for their money. It's a real feather in their cap that they sold their software to Microsoft."

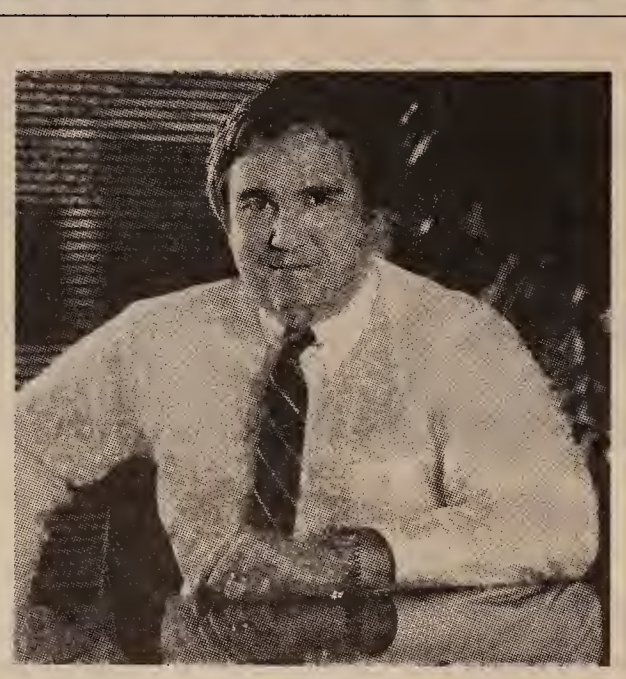
The basics

Microsoft's Enterprise Message Server consists of an X.400 message transfer agent, which it licensed from Data Connections, as well as message store and directory services technology developed by Microsoft.

The Enterprise Message Server, which runs on Windows NT servers, will provide 1988 X.400 and X.500 messaging and directory services for DOS, Windows, Windows NT and Apple Computer, Inc. Macintosh users, Microsoft said. It will ship in early 1993, following the introduction of Windows NT, the spokesperson said.

The DC X400 software is available now. Pricing starts at $200,000 and varies depending on the level of support, service and integration users require.

I Remember Ma.



David Potter, CEO
Source, Inc.

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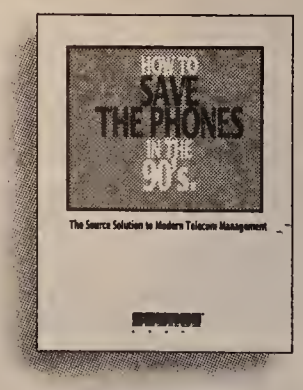

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

"We've put this new boat into the water, and it looks very seaworthy indeed."

Robert Allen
Chairman
AT&T
Commenting on the first anniversary of AT&T's acquisition of NCR Corp.

People & Positions

Maynard, Mass.-based **Digital Equipment Corp.** last week announced that **Kenneth Olsen** will resign from its board of directors effective Oct. 1. This is coincident with his previously announced retirement as DEC president.

State Street Bank Corp. of Boston has named former **IBM** executive **Richard MacKinnon** the first State Street Fellow as part of a program to help set the financial firm's overall technology strategy. He is a former manager of IBM's Cambridge Scientific Center.

Telebit Corp., a Sunnyvale, Calif., modem vendor, has named **Ron Ruday** as vice-president of manufacturing operations. He will be responsible for the company's manufacturing organizations and will report to Michael Ballard, Telebit's president and chief executive officer.

Ruday previously was vice-president of manufacturing operations for Digital Microwave, Inc. in San Jose, Calif.

Thomas Clifford last week was named manager of channel marketing at **CrossComm Corp.**, a Marlborough, Mass., bridge/router vendor. Previously, Clifford was manager of the communications product group at Sequoia Systems, Inc., also in Marlborough.

Government Printing Office brings its mission on-line

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — The U.S. Government Printing Office (GPO), which is responsible for printing all federal agency documents, recently launched a database service that will enable users to retrieve information on-line rather than in printed form.

The relentless output of information from the government requires the GPO to issue 27.2 million copies of documents each year. While the agency has, in recent years, made some of these documents available on CDROM or computer tape, most still end up in printed form.

With the Federal Bulletin Board, the GPO hopes to give users a quicker and less expensive way to get information. "It's very low-priced," said Judy Russell, the GPO's director of electronic information dissemination services. A 50K-byte file starts at $2, while the maximum charge for a 1M-byte file is $21.

Since downloading large files over dial-up lines would require substantial connect time, the GPO expects some on-line users will simply use the bulletin board's electronic mail system to order files to be delivered on computer diskettes.

Only four federal agencies have loaded documents onto the bulletin board so far, but others are likely to join if the system becomes widely used. Information posted on the board includes new Medicare pricing plans, energy data and other information affecting businesses as well as local and state governments.

While the bulletin board may facilitate information access, it lacks some of the sophistication of private-sector database services. For instance, the GPO files have no uniform format or common search words because they are presented according to the dictates of each agency. Some files can be downloaded into WordPerfect and others into Lotus 1-2-3, PostScript, ASCII or DB2.

Users can browse free of charge through documents supported on the board, which is based on Galacticomm, Inc.'s Major BBS product running on a microcomputer. But before downloading documents, users must have an account under the GPO's deposit account system.

Because the Bush administration is not eager to see the GPO

(continued on page 42)

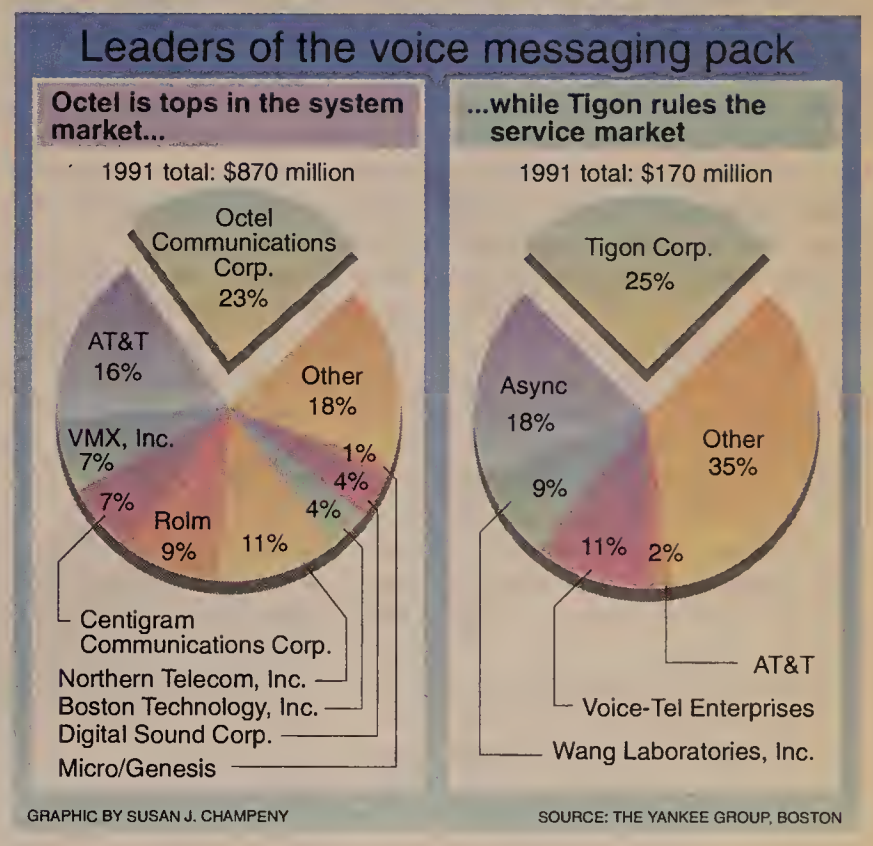
INDUSTRY BRIEFS

IBM to help steer VIM. IBM last week said it has joined the steering and technical committees of the Vendor-Independent Messaging (VIM) interface specification group, an organization backing an open messaging application program interface. IBM joins Apple Computer, Inc., Borland International, Inc., Lotus Development Corp. and Novell, Inc. as VIM committee members. IBM plans to support VIM in its office systems products.

Cabletron seeing Blue. Cabletron Systems, Inc. last week announced it has joined IBM's NetView Partners/6000 Program to ensure that its products can interoperate with IBM's AIX NetView/6000 network management platform. IBM will test the Management Information Base (MIB) extensions of several Cabletron products supporting the Simple Network Management Protocol and will include those MIB extensions in a list made available to AIX NetView/6000 users.

Fax vendors respond. Five vendors last week announced the formation of a new industry consortium, dubbed the Fax Response Industry Association, designed to promote the benefits of fax-on-demand applications. Fax on demand, also known as fax response, enables companies to provide information by

(continued on page 43)



Octel expands scope with bid for Tigon

Vendor plans to use service bureau's expertise for advances in digital networking and net mgmt.

By Bob Brown
Senior Editor

MILPITAS, Calif. — Not satisfied to be just the leading provider of voice messaging systems, Octel Communications Corp. recently announced plans to buy Tigon Corp., the top voice messaging service bureau firm, from Ameritech.

Terms of the proposed acquisition, which Octel executives expect to be completed by mid-October following regulatory approval, were not disclosed.

Doug Chance

The acquisition could be a boon to users that would like to see Octel beef up the digital networking and net management capabilities of its customer premises equipment offerings by leveraging some of Tigon's technology in those areas.

"I feel good about this," said Jerry King, manager of telecommunications technology at General Electric Co. in Fairfield, Conn. "Tigon has a comprehensive digital network of voice messaging systems, and I'd like to see Octel add to the analog networking it currently offers. Also, I think Octel and Tigon together might be able to come up with some solutions to the problem of providing voice messaging to our smaller offices."

Octel, based here, reported revenue of $188.8 million for fiscal 1992, ended June 30, garnering it about one-fourth of the $870 million voice messaging market, according to The Yankee Group, a Boston-based market research firm (see graphic, this page). Octel is also coming off the recent acquisition of Compass Technology, Inc., a Sarasota, Fla.-based vendor of personal computer-based voice processing software.

Dallas-based Tigon had revenue of about $40 million last year, accounting for about a quarter of the service bureau market. Tigon was acquired by Ameritech in 1988, but the carrier decided to unload it because officials felt regulations hampered their ability to expand the company. Tigon will now op-

(continued on page 43)

Siemens puts final touches on business consolidation

By Bob Brown
Senior Editor

SANTA CLARA, Calif. — Siemens AG this week will announce it has completed consolidation of its U.S. private telecommunications equipment and marketing units into a single organization named Rolm, a Siemens company.

The consolidation, to be effective Oct. 1, blends Rolm Co., Rolm Systems, Tel-Plus Communications Co. and Siemens Private Communication Systems, Inc. into Rolm. The moves stem from Siemens' acquisition earlier this year of IBM's 50% stake in the private branch exchange maker.

The restructuring is designed to streamline Siemens' PBX operations in the U.S. so that product development and marketing decisions can be made more quickly, said Peter Pribilla, Rolm's president and chief executive officer.

"Users have been relatively confused by our organization in the past," Pribilla said. "Now we'll have one company again with one mission. From a customer's point of view, this should be a much more clear picture."

Users will continue to deal with most of the same individuals at Rolm that they've dealt with in the past, Pribilla said. Rolm has no plans for layoffs, though some turnover is inevitable since the company will be asking certain employees to relocate.

Peter Pribilla

As part of the consolidation, Pribilla named his management team, which consists of an even split of executives previously with the IBM/Rolm Systems Division and Siemens. The team includes Roger Bacon, vice-president of marketing; Dean Beckwith, senior vice-president of service and support; Gebhard Doermer, executive vice-president and chief financial officer; Karl Geng, senior vice-president of manufacturing and office of the president; Les Lesniak, senior vice-president of sales; and Juergen Wuesterney, senior vice-president of development.

In a move related to the organizational restructuring, Pribilla announced that the Siemens HCM 200 has been integrated into the Rolm product line and renamed the Rolm 9200.

The mid-range PBX is designed to support as many as 80 lines and can be used with Rolm's PhoneMail SPS voice messaging system.

Rolm said it will make available in mid-1993 a new digital station card that enables users to employ RolmPhones with the Rolm 9200. The digital phones that previously operated with the HCM 200 have been renamed the RolmSet 9200 series.

Aside from Siemens' Saturn products, which are nearing the end of their life cycle, the HCM 200 has been the only major Siemens PBX offering sold in the U.S., Pribilla said.

GPO brings its mission on-line

continued from page 41

get into the on-line services market for fear that private-sector firms would suffer, the matter is becoming a political hot potato.

The current administration's Office of Management and Budget (OMB) recently said the GPO's mission in publishing documents means printing them, not making them available electronically. But the OMB statement provoked criticism from many, including the American Library Association, which called the OMB's interpretation of the law "unduly restrictive."

Meanwhile, vice-presidential candidate Sen. Al Gore (D-Tenn.) has proposed an even larger role for the GPO in his new bill, the GPO Gateway to Government Act of 1992, which is similar to an earlier bill introduced by Rep. Charles Rose (D-N.C.).

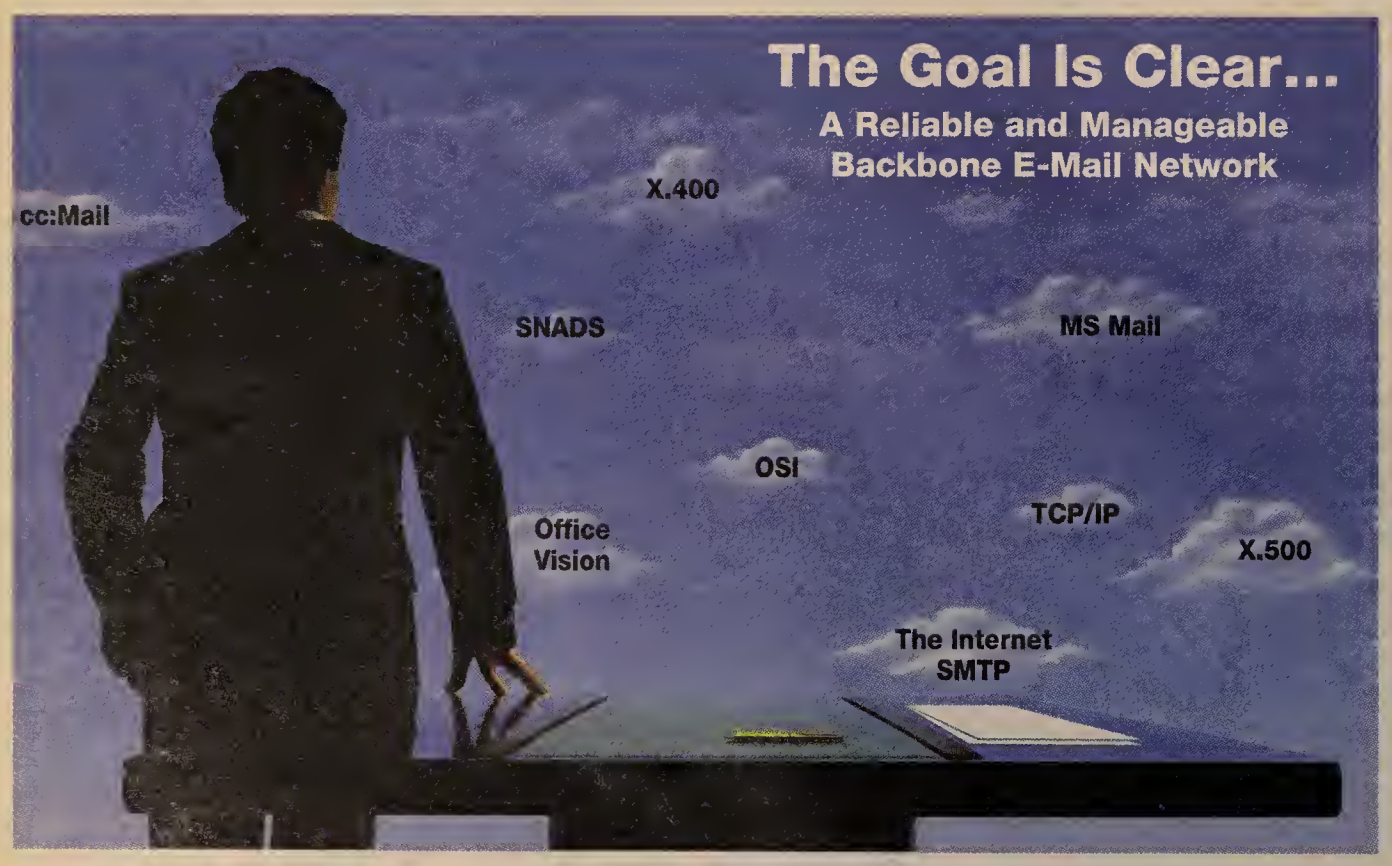
Gore wants the GPO to set up a more elaborate database service that would have full-text capability and serve as an electronic archive, initially offering the *Congressional Record* and *Federal Register*. The GPO Gateway, designed with access to the Internet and National Research and Education Network, would be free for the 1,400 depository libraries nationwide that currently receive GPO-printed material free.

The Bush administration recently stated its opposition to the Gore and Rose legislation, calling it costly and harmful to competition. The Information Industry Association (IIA) has also cited concerns over the bills.

"There could be a detrimental effect on private database services," said Steven Metalitz, the IIA's vice-president and general counsel. He pointed out that government subsidy had the potential to discourage and lessen competition and drive out investment by the private sector.

But a host of others, including the American Library Association, the Taxpayer Assets Project, Educom, the Coalition for Networked Information and the American Society of Authors and Journalists, are lined up behind the two congressional bills.

The GPO itself is eager to take on the project. "The GPO is not just for printing anymore," Robert Houk, head of the GPO, recently told Congress. "The fulfillment of our mission in the information age requires that we expand our electronic information services to the public."



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Albuquerque, NM
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Wednesday, October 28

Atlanta, GA
Atlanta Marriott Marquis
Tuesday, October 6

Boston, MA
The Westin Hotel
Tuesday, November 17

Chicago, IL
Chicago Marriott Downtown
Thursday, September 17

Cincinnati, OH
Marriott
Tuesday, December 1

Cleveland, OH
Airport Marriott
Thursday, December 3

Dallas, TX
Marriott Park Central
Tuesday, October 13

Denver, CO
Denver Marriott West
Thursday, September 24

Detroit, MI
Hyatt Regency
Wednesday, November 4

Houston, TX
Hyatt Regency
Wednesday, October 14

Indianapolis, IN
Marriott Courtyard
Wednesday, October 14

Los Angeles, CA
Westin Bonaventure
Tuesday, September 22

Minneapolis, MN
Minneapolis Airport Marriott
Thursday, October 22

New York, NY
Helmsley Palace
Wednesday, September 30

Orange County, CA
Irvine Hyatt Regency
Thursday, October 8

Pittsburgh, PA
Hilton Hotel & Towers
Thursday, October 22

Princeton, NJ
Hyatt Regency
Tuesday, October 13

San Francisco, CA
Sheraton Palace
Thursday, September 24

Santa Clara, CA
Renaissance Ctr-TECHMART
Wednesday, September 23

Washington, DC
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Octel expands scope with bid for Tigon

continued from page 41

erate as a subsidiary of Octel and retain its existing management structure.

According to Mark Lowenstein, program manager for telecommunications at The Yankee Group, the combination of the two firms "solidifies Octel's position as a major force in the overall voice processing market."

While Octel and Tigon are in different segments of the market, they have forged closer bonds over the past year that bode well for the new relationship, Lowenstein said.

Tigon, which has based its service on VMX, Inc. voice messaging systems, signed a multimillion-dollar agreement with Octel last year, under which it has begun installing Octel's high-end Sierra messaging systems, he said.

Leveraging Tigon's assets

Doug Chance, Octel's president and chief executive officer, said Octel will be able to leverage Tigon's technology and expertise. Tigon has a wealth of experience in managing a large voice messaging network, and Octel will look at ways to offer management, billing, directory and other administrative services to private voice messaging net users, he said.

Having Tigon in its fold should also augment Octel's efforts to balance its business by winning contracts from regional Bell holding companies and foreign post, telegraph and telephone administrations, Chance said. Octel should then be able to sell services to the carriers that have not been interested in buying customer premises equipment.

As part of the acquisition accord, Ameritech has already agreed to buy back voice messaging services from Tigon and sell them to residential and small business customers, he added.

In general, industry observers reacted positively to the announcement.

"I think this will enable Octel to sell more customizable voice messaging offerings to users," Lowenstein said. "Whereas Octel would have pushed only CPE on users in the past, now it can offer a hybrid CPE and service offering that might better fit the user's needs."

Donald Van Doren, president of Vanguard Communications Corp., a Morris Plains, N.J., market research firm, said the key to the acquisition could be "the back-office expertise — the billing, administrative and management skills that Tigon honed as a network operator and service provider."

Van Doren warned, though, that "Octel will need to maintain its focus on the voice messaging CPE business" or its customer premises equipment customers could wind up getting short shrift.

Vencat Mohan, executive vice-president of marketing at VMX, Octel's major competition in the voice messaging system market, said the acquisition indicates that Octel is starting to pay more attention to the voice messaging service market, whereas VMX is focused squarely on the customer premises equipment arena.

Although more detailed information about the agreement is unavailable, Mohan said, "We believe we will be unaffected by this move."

Industry Briefs

continued from page 41

fax via a computer system controlled by a telephone keypad.

The association will issue white papers, hold seminars and discuss standards. The group's founders include AudioFax of Atlanta, Dialogic Corp. of Parsippany, N.J., FaxBack, Inc. of Beaverton, Ore., GammaLink, Inc. of Sunnyvale, Calif. and Ibex Technologies of Placerville, Calif.

Membership is open to businesses involved in the development and marketing of enhanced fax systems and applications. Inquiries can be faxed to Art King of FaxBack at (503) 690-6399.

Cascade garners new funds. Cascade Communications Corp., a Westford, Mass., frame relay switch vendor founded in 1990, recently announced it has received $6.7 million in second-round financing.

The company has also expanded U.S. operations by opening three regional sales offices.

Repeat investors include ABS Ventures, Charles River Partnership, Matrix Partners and Sigma Partners. New investors include Bessemer Ventures and Advent International. The second round of financing brings Cascade's total funding to more than $10 million.

Cascade's new sales offices will be located in Burlingame, Calif., South Bend, Ind., and Mt. Laurel, N.J.

SMDS, FRAME RELAY, ATM.
QUESTIONS?

T1 AND T3 ANSWERS FROM DIGITAL LINK.

Building a data communications network always requires combining today's equipment and services and tomorrow's technology.

Digital Link is an acknowledged leader in high-speed data communications technology, providing modular products that fill today's networking needs while preparing the network and the user for tomorrow's technology.

The DL100 Digital Service Multiplexer is perfect for dedicated T1, Fractional T1 or Frame Relay network access. This modular unit connects up to five DTE devices, with a DS1 device, to these services. A simple plug-in module upgrades the unit to the DL200 T1 SMDS Converter, allowing it to handle DXI protocols (2.1 & 3.2) or HDLC standard internetworking to SMDS services. Frame Relay to SMDS in a single product.

DL100 and DL200 T1 DSM.

For T3 requirements, the DL3100 Digital Service Multiplexer connects up to three HSSI or V.35 devices to a T3 network. The DL3200 Data Service Interface, meanwhile, provides T3 SMDS data access today as well as ATM support in the near future. The DL3100 can be upgraded to a DL3200 with the addition of a single module. Both units are directly manageable via SNMP for complete network integration.

The DL3000 DSM takes T3 data access a step further, supporting up to four T3 circuits in a single SNMP manageable shelf. The DL3000's modular design provides true bandwidth management for broadband data networks.

DL3100, DL3200, and DL3000 T3 DSM.

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Worth Noting

"We've recently published standards [dictating] which vendors you can use in the PC LAN environment. And senior management is now strictly enforcing those standards. That's a change for us — a different way of looking at things."

Mike Cordo
Director of information processing and telecommunications
American Express Travel Related Services Co.
New York

Manager Minutes

AIX EXPO '92, the second annual conference and exhibition devoted to IBM's AIX operating system, will be held Oct. 19-23 in San Jose, Calif.

This year's conference will examine not only AIX, but also the Performance Optimization With Enhanced RISC (POWER) architecture of IBM's RISC System/6000. The keynote address, to be delivered by William Filip, president of IBM's Advanced Workstations Division, will focus on the future direction of POWER-based Reduced Instruction Set Computing technology.

In addition, AIX EXPO '92 will feature several seminars divided into such tracks as management, technical computing, techniques and tools, industry applications and computer-aided software engineering studies. It will also offer lecture and laboratory courses.

The conference costs $795 for users who register before Oct. 2 and $995 for those who register after that date.

(continued on page 46)

User group net provides communications services

Hopes to grow ABUINet into an Internet-like net.

By Joanne Cummings
Senior Writer

BOSTON — Attendees of the Association of Banyan Users International, Inc. (ABUI) Fall '92 conference here will be able to call their home offices and access conference information by tapping into a VINES show network from workstation kiosks.

According to the user group, ABUINet will allow attendees to send and receive electronic mail and facsimile messages, schedule meetings, order session tapes, access conference schedules and other information on-line, while providing feedback to conference organizers through a variety of surveys.

In addition, the group is sponsoring a separate demonstration booth that will enable conference-goers to learn how the network was assembled and how it all works together.

According to ABUI officials, the group eventually hopes to grow ABUINet into an Internet-like network that will offer connectivity and communications services to its members around the world.

"The ABUINet ties together multiple hardware platforms and software applications."

▲▲▲

"The ABUINet is the initial manifestation of how our association can help its members by using our own knowledge and proficiency with this technology to create something unique and useful," said Byron Comp, ABUI president.

Built in conjunction with The Asset Group, a consortium of nationwide resellers and systems integrators, the ABUINet ties together multiple hardware platforms and a variety of software applications. It uses the VINES StreetTalk naming service to provide logon names for all conference attendees, who will be able to access the net through either 386-based workstations provided at the conference or their own portable laptops.

Attendees will be able to tap into a range of applications, including Reach Software Corp.'s Mail and Workflow products, Lotus Development Corp.'s Lotus Notes, a Biscom, Inc. fax gateway, Microsoft Corp. Windows and the latest in VINES software.

"The board has come to realize that it has to practice what its members preach."

▲▲▲

According to Ted Kull, ABUI vice-president, the next logical step for the group is to extend these services to its day-to-day association operations.

ABUI has already made an initial investment in hardware and software to build a core network that members of the board of directors, support volunteers and association management staff can use to accomplish the daily work of the organization. From this foundation, ABUI plans to build an international communications network that can provide information to its membership from a core database, allow the association to manage its support contractors and provide tutorial information on-line.

"Clearly, one of the basic benefits of a networking association is the ability to bridge the connectivity gap," Kull said. "Through this network, we hope to provide services such as electronic balloting for our [Technical Wizard Interest Group] product requirements process, employment listings, training information, product tutorials and, ultimately, a platform on which to test new software."

"We constantly experience the strategic integration of PC networks into the business environment," Comp said. "The ABUI board of directors has come to realize that it has to practice what its members preach."

MANAGEMENT INSIGHTS

BY DAVID FERRIS

Wanted: single PC LAN mgmt. solution

Although you can manage a large Systems Network Architecture network with a single product such as IBM's NetView, managing personal computer local-area networks is hardly as neat.

Proper management requires a wide variety of products, including those for managing individual PCs, servers, physical LAN connections and the LAN internetwork.

In addition, help desk, security and accounting software — as well as tools such as protocol analyzers — are necessary.

Unlike network management in the mainframe or minicomputer world, no single product comes close to providing all that is needed. Many of the best products are from small companies with between 10 and 100 employees.

The result is that a typical network manager uses a range of specialized products from suppliers such as Brightwork Development, Inc., Cabletron Systems, Inc., IBM, Intel Corp., Network General Corp., Novell, Inc., SynOptics Communications, Inc. and 3Com Corp.

Many of these products are exciting. But the trouble is you can have too much of a good thing.

For example, all the products have a different look and feel. To use 10 products, you have to learn 10 different user interfaces.

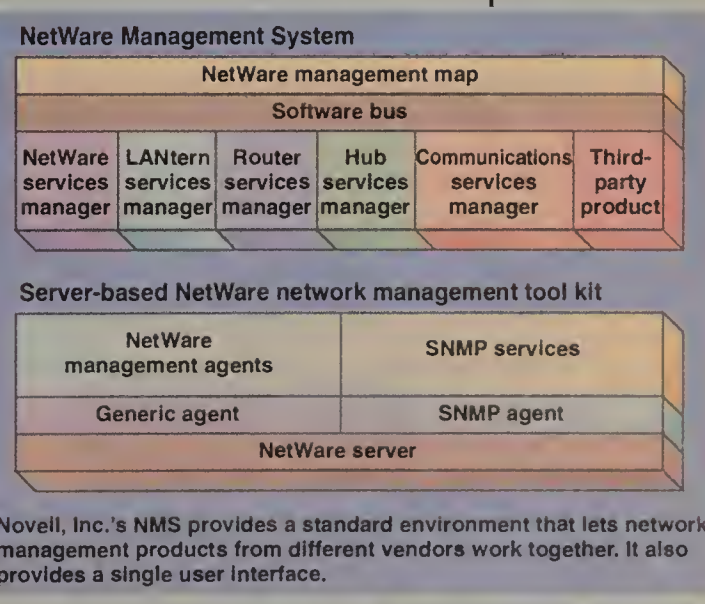
That's an intellectual challenge even if you're doing nothing but network management.

Worse, the products can't share information, meaning redundant data is required and data quickly gets out of sync. It also emasculates the product's power because it can't take advantage of the information available from the other products.

For example, noise on a wide-area network connection will likely generate alerts on the element management systems for the line, modems attached at each end, routers at each end and for the two end processes that are trying to communicate. Taken in isolation, the alerts are just a barrage of information, but they should be gathered and analyzed. Likewise, the trouble ticket system should be able to associate the different alerts and, perhaps, integrate those with the accounting system.

(continued on page 46)

Novell's NMS blueprint



Novell, Inc.'s NMS provides a standard environment that lets network management products from different vendors work together. It also provides a single user interface.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: FERRIS NETWORKS, SAN FRANCISCO

Wanted: single PC LAN mgmt. solution

continued from page 45

In short, what's needed is an integrated network management environment comprising a single piece of software that all network management application vendors could use as the user interface. This would require a style guide that allows different applications to have a similar look and feel, and a standard database structure that lets network management applications access information developed by other applications. It would also need standard APIs that allow control to be passed to and from third-party applications.

The ideal management system would also work for a variety of computing environments, especially PC networks, Macintoshes, Unix workstations, minicomputers and mainframes.

But delivering a truly integrated enterprise network management environment is a tall order. The main options are:

■ **NetView.** This is in place today and is connected throughout most organizations, so it's an attractive idea to let PC network management products feed NetView. IBM's NetView/PC software helps network management vendors do this.

Despite quite a lot of investment and products that provide some level of integration, this hasn't taken off and seems unlikely to do so.

■ **Novell's NetWare Management System (NMS).** Announced in February, this provides a standard Windows network management interface plus standard application program interface (API) for use by third-party developers. Being from Novell, the product is attracting strong interest. As is to be expected, few applications are now available but a good selection should be available by mid-1993. I suspect NMS will do well at the NetWare level, but I don't expect it to be used much to support non-PC network environments.

■ **SunConnect's SunNet Manager and Hewlett-Packard Co.'s Network Node Manager.** These integrated network management environments serve the Unix world and use the Simple Network Management Protocol. They are the best developed and are a good illustration of the way things will be in the future. They both have about 100 third-party network management applications and, right now, the HP product appears to be very much the rising star. Although both are designed for Transmission Control Protocol/Internet Protocol networks, much of what they do applies to PC network management. I'm hoping it won't be very long until Windows-based versions of these application environments appear.

Net management outlook

There's a significant requirement today for an integrated enterprise network management environment. However, you won't be able to install one tomorrow.

Key underlying net management protocols, notably SNMP and the Common Management Information Protocol (CMIP), are still going through major changes. My guess is SNMP will ultimately predominate over CMIP. However, SNMP and its associated databases have a number of serious shortcomings that will need rectifying. The standardization of user interfaces and APIs is also at an early stage, as well.

I'd also guess that a Windows version of HP's Network Node Manager will have the best chance of evolving into the dominant integrated enterprise network management environment. But whatever happens, expect a lot of technology winnowing and confusion for at least the next two years. Today's hothouse mix of PC network management exotics will be with us awhile.

Ferris is the president of San Francisco-based Ferris Networks, which offers research reports, seminars, newsletters and consulting on PC networks.

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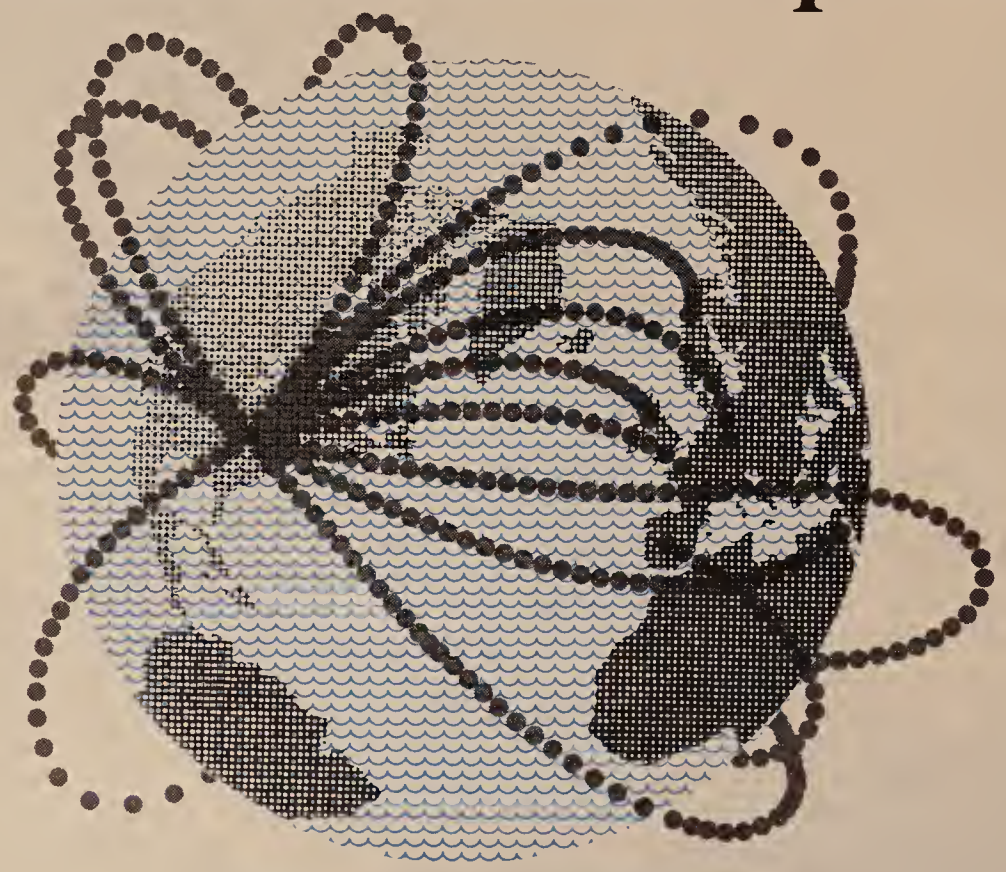

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Manager Minutes

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For more information, contact AIX EXPO '92 at (800) 925-4906.

The **Seventh Annual PC Expo** computer trade show and conference will be held in Chicago Oct. 27-29. It will feature more than 225 exhibitors and over 35 conference sessions covering topics such as OS/2, Windows, local-area networks and client/server architectures.

David House, senior vice-president of corporate strategy at Intel Corp., will deliver the keynote address on Oct. 27. In his speech, he will discuss how the evolution of information systems — including tools such as more efficient networks, graphical user interfaces and powerful computer hardware — will enable individuals to meet increasing demands for faster and more effective communications.

For more information, contact PC Expo at (800) 829-3976.

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Diginet to use Cascade switches in its public frame relay offering

By Bob Wallace
Senior Editor

MERCER ISLAND, Wash. — Diginet Telecommunications last week announced plans to offer a public frame relay service based on start-up Cascade Communications Corp.'s STDX switches in three cities beginning Oct. 15.

Diginet, a regional private-line carrier based here, said the as yet unnamed service will be offered in Portland, Ore., as well as Seattle and Spokane, Wash. Customers will be able to access WilTel's nationwide WilPak frame relay service, which uses StrataCom, Inc. IPXs, through Portland, where both have network switches linked via a V.35 interface.

"We had to offer frame relay to stay in the vanguard of the data communications market and compete with the bigger carriers that plan to offer frame relay in our territory," said Diginet President Dick Stroup.

Diginet evaluated frame relay switches from several vendors before settling on the Cascade platform, which offers greater performance and more features than the others, according to Stroup.

The carrier's STDXs are linked via T-1 lines and, if demand warrants it, more switches will be added.

The frame relay service will support access port speeds from 56K/64K bit/sec to 1.024M bit/sec, with permanent virtual circuits supported at 56K/64K, 128K, 256K, 512K, 768K and 1.024M bit/sec, Stroup said.

Like other carriers, Diginet will allow customers to burst above their committed information rate, the minimum guaranteed bandwidth in a frame relay network.

Stroup said Diginet has tested access equipment made by Proteon, Inc., 3Com Corp. and Wellfleet Communications, Inc. with the service, and products made by Advanced Computer Communications are still being evaluated.

Diginet is also conducting a beta test of the service with at least one large user, which Stroup would not identify. The test will be completed in the next several weeks.

In related news, Performance Systems International, Inc. (PSI), a Reston, Va., value-added network service provider, last week announced it has signed a five-year, $10 million agreement to purchase frame relay switches from Cascade.

PSI will use Cascade's STDX switches in a new national frame relay service called InterFrame, which will provide users frame relay access to the Internet and various public electronic mail nets.

Top carriers testing voice recognition

continued from page 33

MCI's internal trial has been in progress for nine months and involves a voice recognition calling card similar to the Voice FONCard. Although the trial has been going smoothly, Patty Proferes, director of card product marketing at MCI, has conducted several focus groups and is less enthusiastic about the current market for such a card.

"I do not think a majority of users trust this technology initially, particularly with all of the public awareness campaigns stressing calling card fraud prevention," Proferes said. "While the voice card may end up being the most secure card available, it will be a difficult concept to mass market." MCI is also pursuing the technology for automated operator services, she added.

Don't hold your breath

Despite the fact that the major interexchange carriers are all pursuing the voice card application, some obstacles must be overcome before widespread availability can be achieved. The most daunting roadblock is the cost to deploy the technology.

Sprint's Voice FONCard platform, for instance, is deployed in a testing configuration of a limited number of processors. A broad commercial application may require new equipment throughout the network.

Unlike many voice recognition applications, the voice card does not cut payroll or other costs through automation and, therefore, must be able to generate new revenue to justify the cost of the equipment. Most likely, carriers will piggyback the card application on other applications aimed at cutting network costs, such as automated operator or customer service.

(continued on page 88)

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When Hershey Foods Corporation began work on their new headquarters and data center in Hershey, PA, they had strong ideas about premises wiring. Their goal was a universal cabling system capable of linking any user to any network, anywhere, at any time.

It was a tall order. Hershey runs 3270, Token Ring, WANG, and DEC networks, and often needs to connect to three at once at some locations. They wanted maximum flexibility, and found it in the AMP NETCONNECT Open Wiring System.

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AMP Communications Outlets give Hershey the ability to connect any user to any network, anywhere, at any time, within hours. Modular inserts eliminate the need to access and reterminate wiring.

NETCONNECT products for UTP, STP, and fiber are used throughout the installation, but the heart of the 5-building campus strategy is the modular AMP Communications Outlet. Horizontal wiring terminates once to dual outlets at each station, and to similar outlets in a panel at the wiring closet. Inserts in each outlet match equipment to the network; changing inserts at both ends is all that's needed to adapt to new equipment, or to change networks.

Previously, moves and changes took 4 to 6 weeks, and required outside help. Hershey now offers their users 2-day service, and can perform the actual job in less than 2 hours. By avoiding re-pulls and reconnects, they estimate they've already recovered 25% of installed wiring costs in under a year.

For more information about the AMP NETCONNECT Open Wiring System, call 1-800-522-6752 (fax 717-986-7575). AMP Incorporated, Harrisburg, PA 17105-3608. In Canada, call 416-475-6222.

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Rockwell intros call processing offering

continued from page 33

ly monitored by the system.

Spectrum's software supports a number of features.

Call center managers use the system's Script Management Facility and its InfoView Control System terminal to create Telescripts that can be reviewed or verified prior to activation.

The Script Management Facility generates a variety of graphical and tabular activity reports on various facets of call center activities and agent performance.

The system can also produce the Telescript Step Study, which shows caller activity data at each step of an application call flow. This helps identify ineffective call handling strategies and design errors.

The Schedule Manager software uses a real-time schedule adherence display to track agent activity and alert call center managers to deviations from preset call processing schedules.

Spectrum's Intelligent Queuing Announcements give callers current queue status and estimated waiting, and provides them options other than waiting for a free agent. The system's Automated Attendant feature provides users menus for individual applications, individual extensions or assistance.

Spectrum's ACD Mail feature is designed for callers who do not want to wait in a queue or call during typical business hours. Callers can enter their telephone number and leave a voice message. This lights the message waiting indicator on all consoles within the appropriate processing group. The first available agent can then activate a callback with a single keystroke.

ACD Mail lets agents record a maximum of three personal greetings to be played automatically at the beginning of an incoming call, depending on the type of call being serviced.

Spectrum can be used in conjunction with a voice response unit. Telescripts can route calls selectively to interactive voice response applications, along with ANI and DNIS information. Spectrum notifies the voice response unit when calls are connected and disconnected.

Spectrum also enables agents to place outbound calls for such applications as telemarketing, customer service and collections. Call center managers can have agent groups using an adjunct predictive dialer place outbound calls.

Answer Detection Cards in Spectrum automatically connect agents to live calls and disconnect busy or unanswered calls. At a touch of a single key stroke, agents can dial numbers from their display.

With Spectrum, agents can use the SpectraView Console, an ISDN BRI telephone set, to call parties inside and outside of the call center. The system's other PBX features include trunk-to-trunk transfers, direct-inward dialing and least cost routing.

> Spectrum's ACD Mail feature is designed for callers who do not want to wait in a queue. Callers can enter their telephone number and leave a voice message.
>
> ▲▲▲

Regulatory Update

continued from page 33

the abuses. The FCC has not acted on that request.

Industry experts estimate that U.S. corporations lose between $1 billion and $4 billion annually to toll fraud. Toll fraud occurs when individuals steal authorization codes that enable them to dial into a private branch exchange and then dial back out. It also occurs when hackers discover a way to trick voice mail systems into giving them an outgoing circuit over which they can place calls.

AT&T and **Sprint Corp.** have rolled out toll fraud monitoring services that offer users some protection from losses. However, users must pay extra for those liability protection services, and there are some restrictions that could limit user coverage.

Other witnesses scheduled to appear at the FCC's toll fraud hearing include: James Kallstrom of the Federal Bureau of Investigation; Robert Fcx of Sprint; Edward O'Malley of MCI Communications Corp.; Peter Coulter of AT&T; and William Cook, an attorney who specializes in toll fraud cases.

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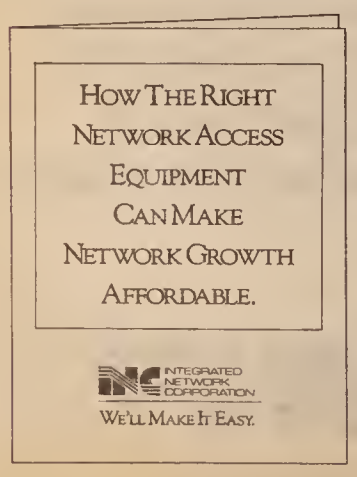

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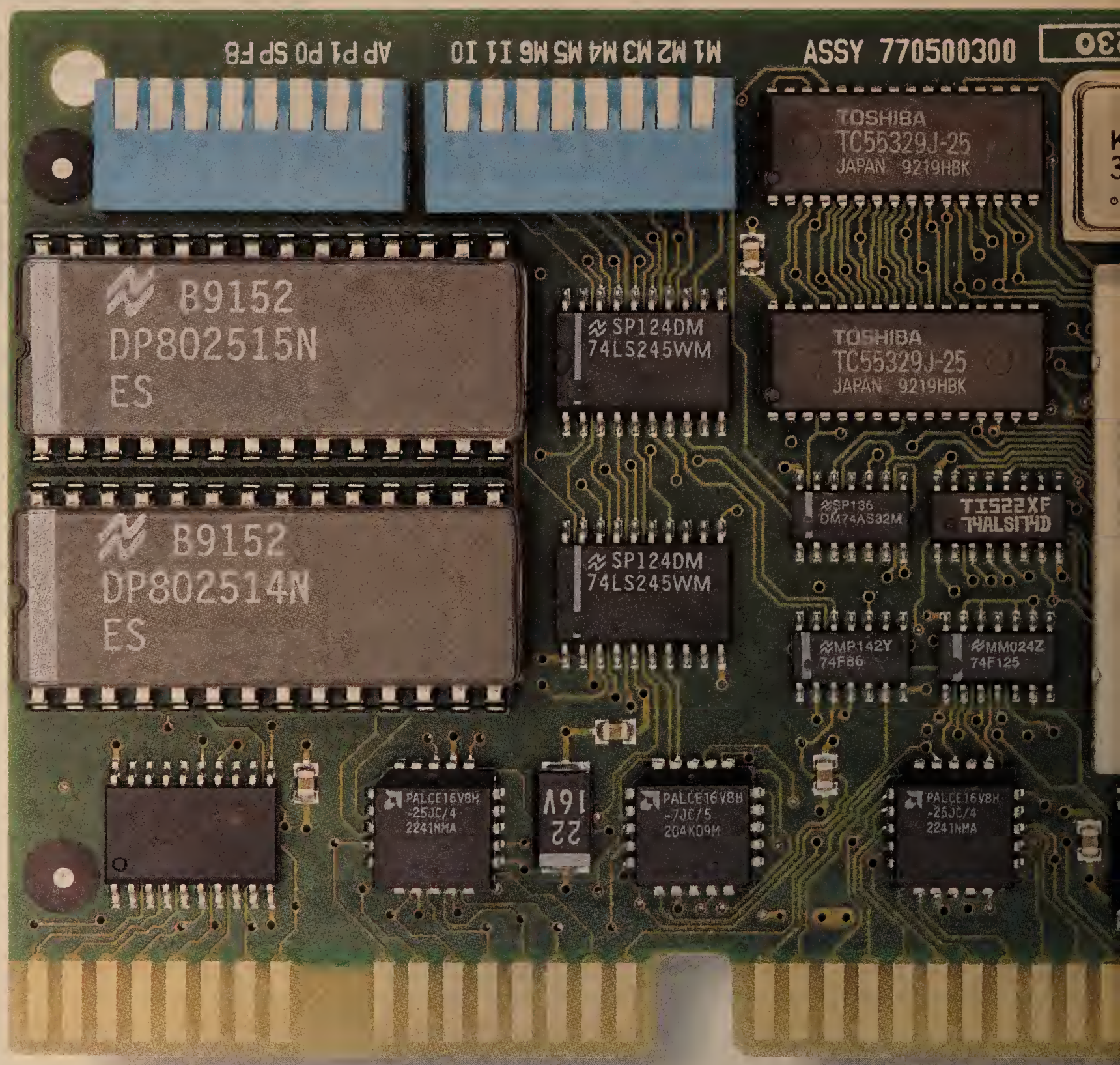

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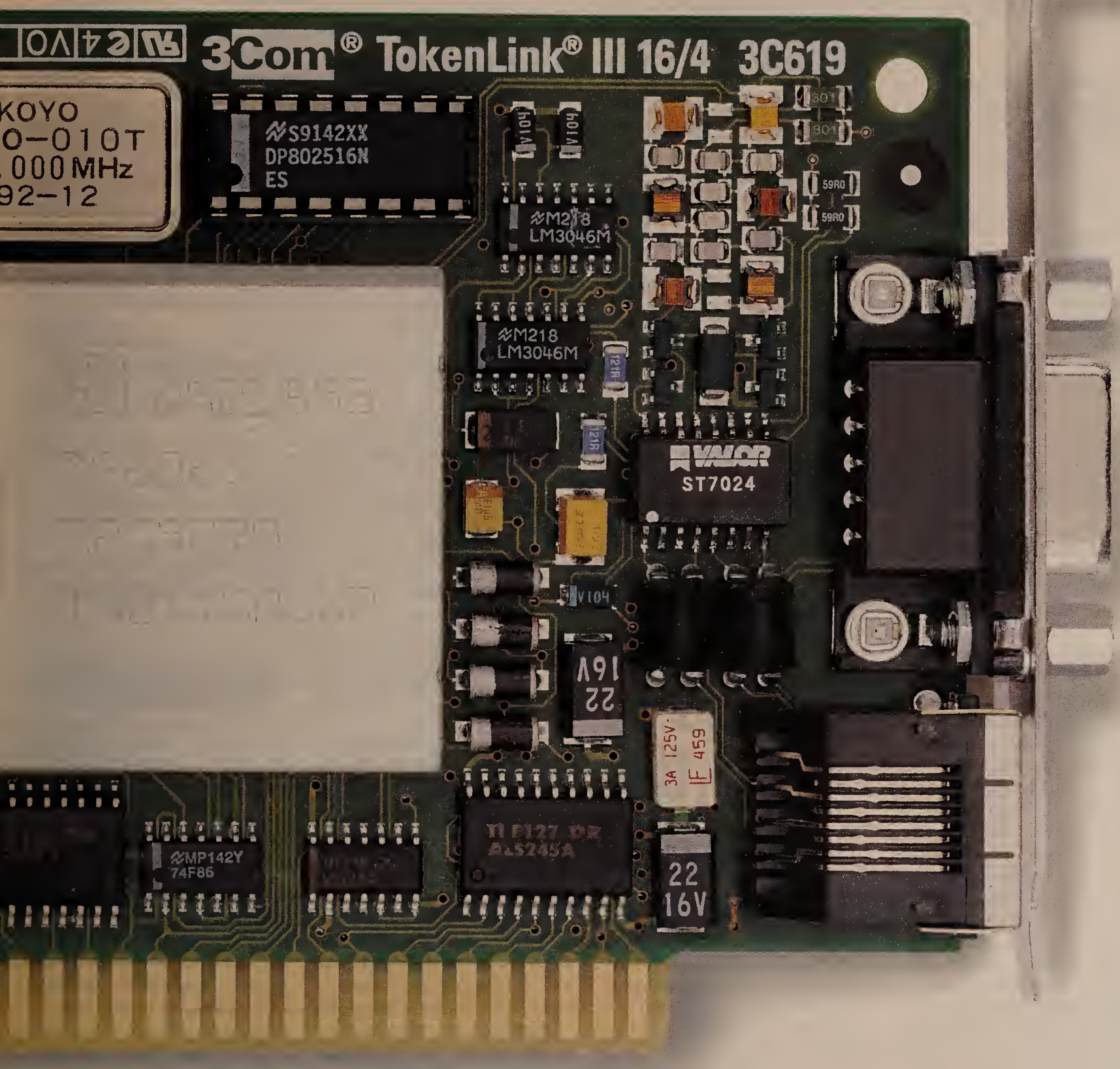

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Circle Reader Service #101

OPINIONS

PCNs

BY IRA BRODSKY

Let's hope squabbles don't shackle PCNs

Emerging personal communications networks (PCN) will change the way we conduct business as much as personal computers did in the 1980s. They will serve as communications platforms for a new breed of microprocessor-based information "appliances" — commodity-status communications equipment — and set new business standards for personal interaction and timely data access. Therefore, network managers should welcome information appliances and support the Federal Communications Commission's spectrum reallocation plans for PCNs, despite the fact that some fixed microwave links will eventually have to be replaced.

Development of the computer spreadsheet transformed PCs from expensive toys into essential business tools. Likewise, PCNs could inaugurate cellular telephone service "for the rest of us." In fact, business users stand to gain the most from this mobile communications service that is less expensive and better than cellular service.

If the three frequency bands proposed by the FCC in the 2-GHz region are allocated, PCNs will be able to offer voice, data and video services. PCNs' microcellular architecture will facilitate the use of low-power transceivers, leading to a market explosion of innovative hand-held products. Users in the field will be able to jot down memos, fill out sales orders and draw sketches, and instantly transmit them back to the office or factory. Digital voice transmission will guarantee the privacy business users demand but don't currently enjoy with cellular telephone networks.

PCN information appliances will be able to switch from network mode to local mode, allowing, for example, two or three users to meet in a hotel lobby and exchange data without consuming net capacity and paying net usage fees. Using personal communications services, users will be able to drop off multimedia catalogs or transmit presentations to wall-size computer displays in conference rooms. Pocket telephones will work over wireless private branch exchanges and residential cordless telephone base stations, as well as public PCNs.

Fears that PCNs will leave us nowhere to hide — permitting business life to intrude on family life — are unfounded. Quite the contrary, the intelligence that will be inherent in mobile communications networks from Day One will enable automatic screening and handling of inbound calls. Voice calls will be preceded by brief messages that identify the caller and subject.

Because they will compete for plain old telephone service, PCNs will bring an end to local exchange carrier monopolies. The result can only be lower prices and a wider variety of services. The local telephone company will finally be forced to compete for all business customers, not just those within the limited reach of an alternative service provider. Such competitive pressure on the local exchange carriers will force them to accelerate development of broadband networks and deployment of fiber in the local loop.

Let's hope we can resolve the regulatory squabbles and get on with PCN construction. Otherwise, U.S. business users — and U.S. businesses — will be denied what could be the most important telecommunications technology as we enter the 21st century.

Brodsky is president of Wilmette, Ill.-based Datacomm Research Co. and chairman of the Wireless Data Conference & Expo, which is scheduled to be held Oct. 13-15 in Santa Clara, Calif.

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EDITORIAL

Tight times provide net mgrs. with unique opportunity

The outlook for network budgets in 1993 isn't all good, but it's not all bad, either. In fact, the budget pressures net managers have endured and will continue to face next year may have a silver lining.

In *Network World's* 1992 Annual Budget Survey, nearly 90% of the respondents say they will hold back on some or all capital equipment spending next year. The conservatism is due largely to the slight decrease survey respondents project for 1993 network budgets.

That's a far cry from last year's survey in which respondents said capital equipment budgets were targeted for a 16% increase and network managers were optimistic that economic conditions would improve, paving the way for net projects.

The economic turnaround many net managers hoped for in '92 never materialized, and as a result, companies are now closely guarding costs. Also, some users are looking for ways to increase savings. Some have even resorted to rebidding supplier contracts to generate savings.

One technology that companies continue to throw money at is local-area networks and LAN interconnection devices. Nearly 45% of respondents' capital equipment budgets are being set aside for LAN-related purchases.

Ronald West, manager of telecommunications and office automation at Shearman & Sterling, a New York law firm, says network migration projects are a hard sell when budgets are tight. But his firm is making the move anyway due to the benefits of LAN environments, including quicker application development cycles, increased responsiveness to market needs and improved price/performance.

The lesson is that technologies resulting in reduced cost structures over the long term will get the green light. But maybe there's a larger lesson from the fiscal austerity now in place.

Maybe the current economic doldrums will force users to look closely at their nets and probe for better alternatives to providing services to end users while still reducing costs. When that happens, network staffs will step forward to become strategic assets to their firms, instead of just service providers.

OPINIONS

NETWORKING FUTURES

BY MARY JOHNSTON TURNER

Net mgrs. should prepare for changing role of third parties

As was discussed last time in this column, leading industry thinkers attending the Northeast Consulting Resources, Inc. Future Mapping workshops expect vendors of all kinds to place an increasing emphasis on support services such as outsourcing in the near future. Network managers need to consider what effect this trend will have on their network support organizations.

The changing role of third-party systems integrators, outsourcers and value-added network service providers is already having a profound impact. Network managers coping with rolling out distributed computing projects are turning to third parties to take over commodity support functions and the fast ramp-up of new technologies, as well as to help support smaller domestic and overseas locations.

The recent creation of Advantis, an international value-added network and professional services company, reflects the pressure on third parties to attain critical mass both domestically and overseas. Increasingly, comparing the cost and capabilities of outside help vs. internal capabilities is de rigueur for staffing any new networking project.

The rise of competent national and multinational professional services vendors couldn't come at a better time. Third parties may be the only cost-effective solution to fill a gaping hole in client/server management — specifically, providing installation and operational support for users and equipment at distributed small and midsize offices.

Given the high cost of locating full-time internal staff at smaller sites, plus the escalating technical requirements of these locations, use of outside third parties is likely to become a standard means of staffing these sites in the near term. This routine use of third parties to support distributed sites means that user companies must reorganize their network management infrastructures.

Creation of consistent problem management and configuration databases that in-house and third-party staff can access is critical. Without accurate information about network equipment, user configurations and addressing services, troubleshooting even a simple problem can be a nightmare and installation of new services can take weeks instead of days or hours.

Increased dependence on third parties in field support and routine operation roles will alter the mix of in-house skills at user companies. In-house staff will need to perform more complex functions such as internet design, addressing management, security management, directory services, contract definition and negotiation, and interoperability planning. They will also spend more time planning for strategic use of the network to support business goals.

Shortages of these skills already exist, so now is the time for net managers to think about recruitment and retraining needs for the next few years. How best to shape the scope of third-party service and support contracts will take up significant management time.

For example, companies contemplating moving support responsibilities for remote sites to a third party might give a single vendor the task of caring for all site-specific communications requirements, such as wiring, telephone and data communications equipment support, remote systems administration and even software distribution. Such integrated "prime contractor" awards are already going to both carriers and outsourcers.

Finally, increased reliance on third parties will require net managers to better understand their companies' internal cost structures. The goal should be to use third parties that can provide higher service levels at lower costs.

New chargeback mechanisms may need to be created, as well. In many cases, vendors may be able to create custom billing formats that allocate costs to individual work groups or sites.

During the next several years, many organizations could see the overall head-count requirements for network and information technology support escalate because of the need to run older hierarchical systems in parallel with emerging distributed computing networks.

Through the effective use of outside parties, network managers can put a cap on that escalation by, for example, minimizing the number of new hires or moving employees to the outsourcing company.

Third parties will be an increasingly important element in the network manager's tool kit. Developing service responsibility allocation frameworks, management database and instrumentation resources, accurate cost models and new in-house skills are key to taking the greatest advantage of this trend.

Turner is a principal with Northeast Consulting Resources. She provides strategic and technical planning to end users and vendors in the areas of local-area network/wide-area network internets, global services, net management and outsourcing.

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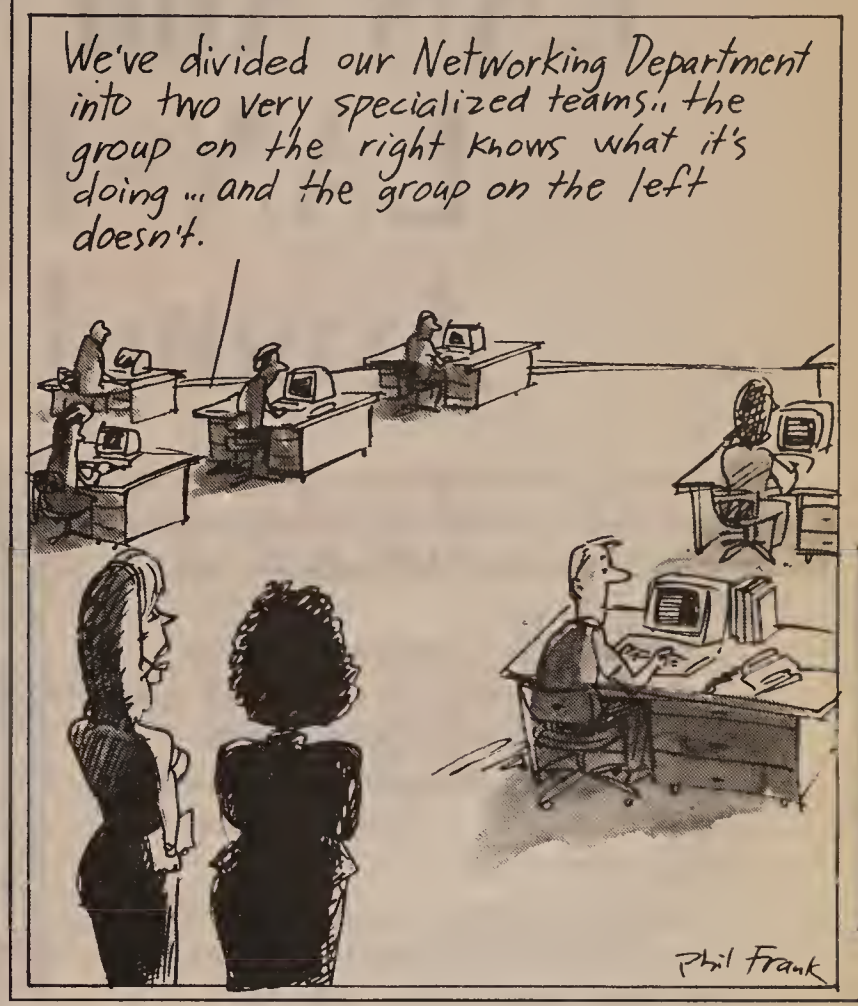
BY FRANK AND TROISE



LETTERS

No single solution

I'm writing in response to the recent column by Douglas Welch ("Network managers in need of resource management tools," *NW,* Aug. 24). I agree there is no single system to meet all the needs of a network manager for a large corporation. In fact, I challenge the idea that such a system should be in existence today.

A system such as the one Mr. Welch desires, which could handle system monitoring, problem tracking, purchasing, inventory management, problem resolution and more, would be years in the making. One piece of software to handle all these areas would require a huge amount of expertise and time to program. Since net management has become extremely complex only in the last few years, the software industry needs some time to catch up.

As a provider of support, inventory and training administration software, we are working with other software companies to create a product that will provide the functionality for which users such as Mr. Welch are looking. However, this will require linking the individual software packages of these companies together so they can share information with one another.

Linking the best products that are available in the network management arena so that they can all share information easily is the best way to tackle user needs, not building an immense system that would take years to develop.

Laura Kingsbury
Marketing coordinator
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Letters may be edited for space and clarity.

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Internetworking often presents major problems in a Token Ring environment. To date, users have lacked an efficient way to integrate distributed LAN applications with mainframe SNA traffic.

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Besides easy installation and usage, GDC's LAN*TMS offers other advanced capabilities, such as its SPF (shortest path first) link-state routing protocol.

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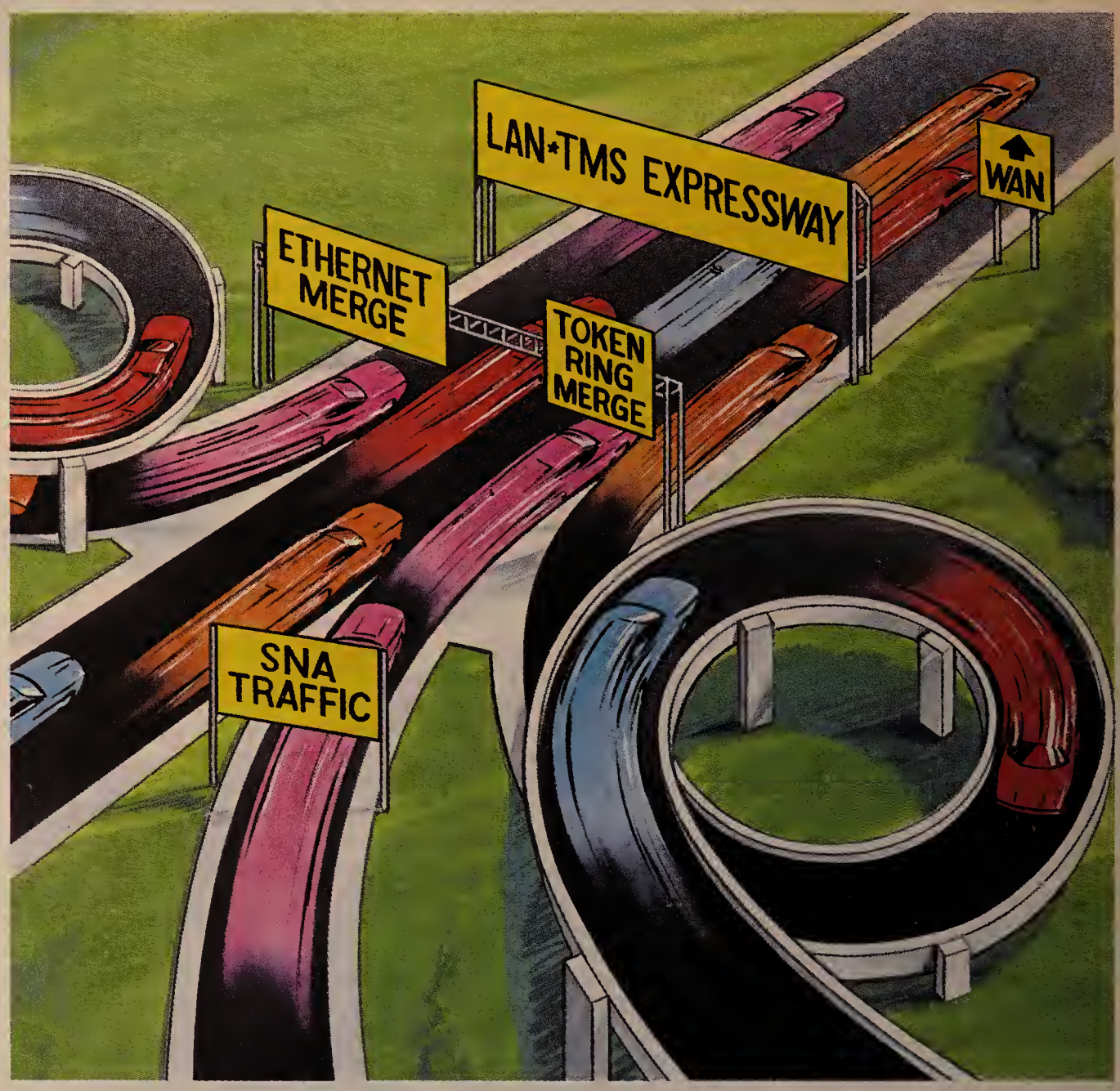

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TELECOM

PBX-TO-HOST APPLICATIONS

The marriage of two worlds

Installed base of voice switches, host computers dictates buying decisions on software that controls interaction between voice and data devices.

Home Box Office, Inc., the entertainment programming provider, is sold on the concept of switch-to-computer interface software.

The company has integrated its Aspect Telecommunications Corp. automatic call distributor (ACD) with a customer database running on a Perkin Elmer Corp. host. When customers lose their HBO program signal, they dial into an 800 number to reestablish the link.

The Chicago-based ACD fields the calls, and when a customer inputs his account number, a program running on the ACD conducts a background check with the host to make sure the caller's account is paid up. If it is, the ACD sends off an authorization signal to a La Jolla, Calif., technical center, which passes it to HBO's satellite uplink facility in Hauppauge, N.Y., where it is bounced off a satellite to the user.

"The whole process takes about 10 seconds," says Nick Ezzo, HBO's telecommunications systems analyst. "Our customers usually get their picture back before they're off the phone."

Just as with HBO, switch-to-computer interface (SCI) software is enabling network users to reap considerable savings and drastically improve customer service operations. However, users intent on purchasing SCI software should understand that the buying process is unlike the purchase of other network software. Currently, there are more than 30 proprietary interfaces on the market, a situation that not only extends the installation period, but also keeps prices high.

The average payback period for a switch-to-computer interface application in a call center with more than 50 agents is 12 to 24 months.

"At this stage of the game, every installation is customized," says Bryan van Dussen, an analyst with The Yankee Group, a Boston-based research firm. "And there

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By MARC ROBINS

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are network issues to resolve, including waiting for the ubiqituous availability of ISDN and inter-LATA testing of Signaling System 7."

In addition, because most companies have already standardized on private branch exchanges, other switch types and host computers, few users will need to compare SCI product differences. Instead, users that already have an installed base of PBXs and host computers likely will wind up purchasing SCI software from their current switch and computer makers.

Still, there are several factors users should weigh as they consider the purchase of SCI products, such as application availability and support for interim processors.

Also, net managers implementing SCI software should realize they can't buy the entire package from one vendor. Typically, PBX and other switch providers offer SCI software to run on their equipment, while computer makers, in turn, offer comparable code to run on their boxes.

Still, despite the proprietary nature of many SCI products, pioneering users are quite satisfied with the improvements the technology brings about.

"We couldn't be happier with the way things have worked out," says Steve MacGregor, assistant vice-president of network communications at Denver-based Oppenheimer Shareholder Services, a division of Oppenheimer Management Corp. "Thirty percent of our calls that were normally handled by our staff are now using the [ACD] system."

According to industry watchers, the market for SCI technology is still in its infancy.

Byron Battles, an analyst with The Aries Group/MPSG, says only about 700 sites in the U.S. are using SCI products. And many of those users are in the transaction-intensive, large call center and telemarketing services environments. These include integrated message centers, customer service and dispatch, and billing and collections operations.

A joint study about to be released by the Aries Group and Dataquest, Inc. predicts significant but steady market growth for SCI technology. In conducting the study, Dataquest interviewed more than 400 SCI product end users.

This growth will be fueled, in part, by the growing number of strategic alliances between switch and computer manufacturers to allow the interconnection of PBX, ACD and dumb switches with host computers. These SCI products are designed to provide connectivity between the switch, host computers, voice response and voice mail systems, individual data terminals and call center stations — in essence, to seamlessly integrate data processing, data communications and voice communications resources.

A few notable alliances include AT&T with Digital Equipment Corp. and Tandem Computers, Inc.; Northern Telecom, Inc. (NTI) with IBM and Hewlett-Packard Co.; IBM with Rolm and Siemens Nixdorf InformationsSysteme AG; and Aspect with DEC, Tandem and IBM.

Switch vendors have built or are building hardware and software interfaces on their switches that allow users and third-party application developers to create new features and provide connectivity to data processing resources, in effect, allowing them to tailor systems to meet the specific demands of customers and to mirror the way they want to do business.

Breadth of applications

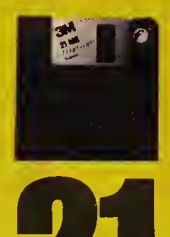
The single greatest factor users should consider when looking at SCI products is the range of applications offered to operate with the vendor's SCI software.

Although it's not as easy to classify SCI applications as it is to classify, say, applications on a desktop personal computer, there are a number of key SCI application categories that are the most sought after by corporate call center operators and MIS departments.

Inbound call routing, or call processing, is the most fertile SCI testing ground. Using network services — such as automatic number identification or dialed number identification service (DNIS) — or automated attendant functions, these applications automatically route the incoming call to the most appropriate department or to a specific customer service agent, based on the careful utilization of host computer database information.

Outbound call management, involving telesales and telemarketing applications, is also a hot area. Switch-to-host interfaces can make the most of sophisticated ACD functions, such as intelligent and predictive dialing.

Another key application involves real-time, coordinated transfer of voice calls and terminal data screens. SCI applications can use voice network-provided ANI and DNIS information to simultaneously deliver specific data files along with a call to a receiving agent's workstation.



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Similar to this but with a twist, simultaneous voice/data transfer applications involve the transfer of inbound phone calls and the data associated with these calls from one company extension to another.

Finally, host database access and retrieval applications involve the use of interactive voice response (IVR) systems and allow callers to use their push-button phones as virtual computer terminals, issuing commands to the host computer to access specific account information or perform various types of transactions ("IVR systems laden with advanced features fill mart," *NW,* April 27).

Application support

While the switch and computer vendors typically provide the actual physical SCI links and operating system and software interfaces, it is increasingly up to third-party SCI application developers to provide specific SCI application products.

For example, AT&T has more than 35 application developer partners, including Aristacom International, Inc. and Nabnasset Corp. IBM has more than 70 business partners for its CallPath Services Architecture products.

These third-party companies help users navigate the complex interfacing of multiple voice and data resources, and provide everything from protocol conversion utilities to programming interfaces. To their credit, these firms aren't tied to a single vendor's vision of SCI and can thus often be counted on to deliver a more innovative and inventive solution to meet a company's SCI feature wish list.

Nabnasset, an SCI software products and systems integrator company, currently supports NTI, AT&T and Aspect SCI products. According to Gregory Borton, company president, "We aim at providing a very high level set of services embodied in a tool kit to let people tie all these benefits from integrated voice and data into their existing installed base of equipment and services.

"One of the most important issues we deal with is how to pass the data between different sites in a company so someone in one service center can work with their existing data base and user interfaces but yet transfer that call to another site with a totally different database and still retain the context of the integrated voice and data call," Borton says.

An effective SCI implementation can indeed deliver a number of important benefits. According to Pat Shafer, manager of AT&T Call Center Products in Bridgewater, N.J., an integrated voice/data environment can result in call center productivity gains that range from 15% to more than 40%. Users can reduce costs for telephone and computer network time, improve customer service, reduce data entry errors, generate time savings from the sometimes tedious data retrieval process, increase the number of calls handled and possibly reduce call center staffing.

Another important benefit of SCI applications is the ability to retain existing switch and computing resources.

Although there are a number of necessary — and expensive — upgrades and add-ons, the cost is still far lower and the implementation far less disruptive than swapping old switches and computers for

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NATA catalog profiling SCI apps on tap

A council of the North American Telecommunications Association (NATA) next month will release a catalog that profiles switch-to-computer interface applications.

"The Computer-Telephone Integration Business Solutions" catalog details products and services offered by members of NATA's Alliance of Computer-based Telephony Application Suppliers (ACTAS).

The catalog will classify various applications by category, such as teleman-agement, help desk, inbound/outbound telemarketing and custom software for vertical markets.

In addition to breaking down the application classes, the catalog will specify application support for switches, hosts, voice processing units, automatic call distributors, protocols and interim processors.

ACTAS will unveil the application catalog on Oct. 5 at NATA's Unicom '92 Expo and Conference in Washington, D.C. The catalog is available to NATA members for $15; the cost for nonmembers is $23. Users interested in obtaining more information about the catalog may call (800) 538-6282, Ext. 260.

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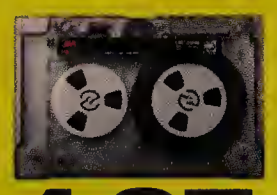

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SCI programmers' dream machines

So-called dumb switches are a dream come true for switch-to-computer interface (SCI) applications developers.

When it comes to private branch exchange-to-host integration, dumb switches available today are providing the platform for some of the most elegant and flexible solutions.

These switches — such as Summa Four, Inc.'s Specialty Digital Switching System (SDS) -1000 and SDS-500, and Teleos Communications, Inc.'s IRX-9000 ISDN Resource Exchange, a switch specifically designed for IBM's CallPath/400 software applications — are built from the backplane up with custom application development in mind.

Dumb switches are completely controlled by host computers — from personal computers to mainframes — and are completely dependent on their host in terms of providing specific features and functions within a voice/data application.

This type of open architecture carries a number of important benefits, such as immunity from PBX software upgrades. That's because all enhancements are made on the host-based software. Also, the switch comes with a universal interface, enabling it to connect with practically every analog and digital network circuit made, including T-1 and Integrated Services Digital Network.

Because dumb switches present an open hardware and software architecture to the user, they are providing a level of flexibility and customization unavailable with more traditional smart PBXs. Dumb switches are being used as ISDN servers, where they work as an adjunct processor to a non-ISDN PBX, and as multiapplication platforms.

Accelerated VOICE, a San Franciso-based 800/900 service bureau with operations in Reno, Nev., provides a full range of enhanced call, voice and facsimile processing applications. These include database compilation and analysis, voice capture and transcription, fax retrieval, conferencing, full automatic number identification capture for fraud control and customer identification, as well as credit card and order processing.

Accelerated VOICE's arsenal of equipment includes Summa Four's ISDN-ready 1,776-port SDS-1000 and 408-port SDS-500 switches for network and call control, Executone Information Systems, Inc.'s 228 and 432 PBXs, PC-based host computers for running applications, and the company's own 24-port AVRS 24, an in-house voice reponse system, and its 48-port AVRS 48 PC-based voice response systems.

The PC hosts are connected on an Ethernet local-area network to the voice response systems, allowing for call handling and status messaging between the systems.

Accelerated VOICE uses Summa Four's SDS-1000 as a gateway to other devices at the bureau, while the SDS-500 is used for applications development.

"We bought the Summa Four switches because they are totally open and work well with PC-based controlled host interfaces," says Ted Glenwright, Accelerated VOICE's president.

The SDS-1000's ISDN-ready capability is also a major benefit. Accelerated VOICE is able to take advantage of ANI when requested by a user and use it for database building and fraud control on 900 numbers, whereby it blocks certain customers who are notorious for not paying their telephone bills.

One of the bureau's hottest SCI applications is using Summa Four's SDS-1000 to integrate Dialed Number Identification Service (DNIS) and ANI, regardless of the long-distance carrier delivery method. The host processor performs real-time ANI validation for each DNIS and converts to both inband and out-of-band formats for handing off the call to an AVRS 24 voice response system or to live agents.

In effect, MCI Communications Corp.'s Multi-Frequency (MF) signaling used with ANI is converted into Sprint Corp.'s format for inband ANI by dual-tone multifrequency signaling. Since the Executone PBXs that Accelerated VOICE uses are not MF-compatible, the SDS-1000 provides the signaling translation necessary for ANI.

"You can bring in all of your carriers and multiple formats — whether they're ISDN, MF or whatever the carriers decide to force the world to deal with — and convert them to whatever format your switch wants, whether it's a total analog, passive switch hook to more sophisticated digital T-1 and ISDN signaling," Glenwright says. "Because the switch works so fast, a caller won't even realize he's going through a signaling translation."

— Marc Robins

(continued from page 63)
brand new ones.

Aside from application support, the other major factor involving the purchase of SCI software is whether it requires use of an interim processor.

SCI vendors often sell their software bundled onto a processor board that slides into an expansion slot on a switch or host computer. The SCI card often provides extra memory for switches that have the intelligence to conduct protocol translation between a switch and a host.

More often than not, though, with so many different protocols supported between hosts and switches, SCI products require users to install an interim processor to handle protocol processing between the switch and the host. In addition to off-loading the chore from the switch, interim processors may be required if the switch doesn't handle digital formats.

Some interim processors can also be positioned as gateways between multiple hosts and provide the protocol translation among several different hosts.

In the accompanying Buyer's Guide chart, many vendors, including Aspect, AT&T, DEC, HP and IBM, require interim processors.

Some vendors, such as PBX makers Executone Information Systems, Inc., Mitel Corp. and NTI do not require interim processors. While that may save the user the expense of integrating an extra device into the setup, it may also impose performance limitations.

For instance, Executone Information Systems' SCI product, the Executone Integrated Digital System, allows users to bypass an interim processor, but users must communicate with the host over a relatively slow RS-232 link instead of a faster X.25 or other connection. This could become a limitation because the slow link may create processing delays or slow data exchange with the host.

IVRs to the rescue

Users that deploy SCI technology have two options when it comes to providing the user with an interface to SCI applications. They can employ ANI and DNIS, or use an IVR system to greet users.

Using ANI, the public network provides the caller identification data that links a caller's phone number to business accounts. Host computers then conduct look-ups to locate customer files, which are then passed to the agent along with the call.

IVRs instead identify and collect specific information from the caller to pass along to the host computer. Callers key in their own account information, so network managers don't have to maintain separate lookup tables to link ANI data to customer records. Almost all SCI vendors offer optional support for IVRs.

API vs. SPI

Application program interfaces (API) are specialized programs that establish the signal link between a particular host computer system and switch, and provide an interface to the host so programmers can control what kind of data and instructions are sent to the switch. Each brand of computer system requires its own API.

IBM has CallPath, DEC has DECigs, DECagw and Computer Integrated Telephony and HP offers Applied Computerized Telephony. The major computer systems vendors have attempted to open up their APIs and share them with PBX makers and third-party application developers. One key point users should consider: The APIs vendors supply are highly customizable. So, even though a functionality of feature may not be available, it may be possible to convince the vendor to add a new wrinkle to the product.

Likewise, each brand of switch requires its own special switch program interface (SPI) software. This software, in effect, serves as the "driver" for establishing the signal link between a particular switch and a host, and controls what call and status information is sent to the computer, as well as certain functions and commands on the host.

Inflated pricing

One of the greatest factors in evaluating SCI products is the technology's high price tag for a total implementation, with projects costing on average between $160,000 and $340,000, with some in the millions of dollars.

While prices in the Buyer's Guide chart fall well under $100,000, users need to consider all the costs, including SCI software for both the host and switch, software licenses, memory upgrades for hardware and new hardware, where needed.

Only the largest corporate call centers and telemarketing service organizations can afford the luxury.

"The SCI market is striving to break out of the call center, but it's not there yet," says John Rasmus, director and principal analyst in voice communications at Dataquest. "The costs have to come down and be more attractive before the technology moves downmarket. We don't see that happening within the next 24 months. At present, the best way for a small company to test the SCI waters is to implement some kind of IVR setup."

Emerging standards

As the market for switch to host interfaces slowly matures, users are beginning to demand some degree of standardization.

There are a number of positive signs that manufacturers are starting to heed. Several switch and computer manufacturers are encouraging value-added resellers and strategic partners to tinker with their links by providing open protocols to interested parties. Such vendors and their protocols include IBM's CallPath Services Architecture, NTI's Meridian Link, DEC's Computer-Integrated Telephony and HP's Applied Computerized Telephony.

There are also three standards committees struggling to impose order on the SCI marketplace. The European Computer Manufacturers Association (ECMA) is developing a body of standards called Computer-Supported Telephony Applications (CSTA); ANSI is pushing its Switch-Computer Application Interface (SCAI); and AT&T is backing a standard put forth by the ISDN/Digital Multiplexed Interface (ISDN/DMI) User's Group.

According to Aries Group's Battles, "Every vendor is monitoring standards, but they would like the standards to be as close to their proprietary specifications as possible; that's the main reason IBM withdrew from the ECMA committee, which it chaired. Even when the standards become final, they will still be the lowest common denominator."

While the SCI market confines itself to high-end, call center-related environments, there will be little pressure on manufacturers to conform to any established standards.

However, there are signs that the scope of SCI applications are beginning to extend beyond the traditional call center installations to serve more of the general corporate environment.

Edward Bennett, president of Amcom Software, Inc., a third-party software and SCI consultancy, says, "Some of our applications perform automated PBX update functions and linkage between PBX maintenance activities and off-board computer applications.

"Others provide computer-driven display of messages on the LCD displays of individual user telephone sets, or allow a telephone user to access information from a computer through the LCD display," he says. "Still others

(continued on page 86)

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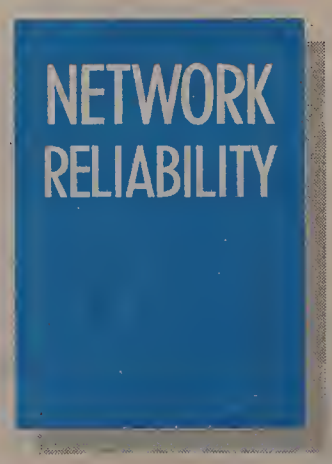

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ANNUAL BUDGET SURVEY

Network budgets tread water

Economic doldrums leave budgets flat; net managers to closely police costs, spending.

CONTINUED FROM PAGE 1

companies had seen the worst of the economic doldrums and business would rebound.

But that air of optimism has evaporated and has been replaced by resignation that the economy won't improve anytime soon. In fact, more than two-thirds of the respondents say they think economic conditions will either stay the same or worsen next year.

Although the overall average 1993 budget is slightly lower than 1992's, the survey turned up some telling differences. Managers in several industries, such as insurance and banking/financial services, plan to boost spending as they retool their nets to become more competitive.

Managers in other industries, including wholesale/retail and health care, are decreasing expenditures due, in part, to employee cutbacks that reduce the demand for network services.

Some other significant findings of the survey:

- Nearly 90% of those surveyed plan to hold back on some or all capital equipment expenditures next year.
- Payback periods for capital expenditures will shrink yet again, decreasing by an average of three months over last year and making it more difficult to gain upper management approval for major network projects.
- Although budgets are flat, the dollar amount senior members of networking departments can authorize without needing further approval has increased at almost two-thirds of the sites surveyed.
- The bulk of cash that managers are planning to spend is being reserved for local-area network and LAN-related capital equipment expenditures.

Managers faced with tight budgets next year say they are concentrating on streamlining current systems, rather than making sizable network investments.

"We're biding our time," says Mike Cordo, director of information processing and telecommunications at American Express Travel Related Services Co. in New York. "A lot of what we do now relates to our point-of-sale net. We're constantly refining it to make it more efficient and cheaper to run."

Cordo's view is held by the vast majority of respondents who say they are planning to hold off on some or all major capital equipment expenditures next year. This is a significant change from last year's findings, which indicated that respondents had planned capital equipment increases averaging 16% ("Capital equipment budgets showing dramatic growth," *NW,* Sept. 23, 1991).

"We got a little too big for our britches," Cordo says. "And competition and the economy have cut us down a notch. We realized we had to spend money to turn things around [this year], and revenues have started to come back, but they haven't grown as fast as we'd like."

However, the one project users continue to set aside money for is the downsizing of mainframe applications to distributed LANs. Even companies in industries such as business/professional services, which say they plan to cut net expenditures by about 2% on average, are scraping up the cash to invest in downsizing.

"Migrating to LANs is a lot more difficult to justify [when budgets are tight]," says Ronald West, manager of telecommunications and office automation at Shearman & Sterling, a New York law firm. "But we're going to do it

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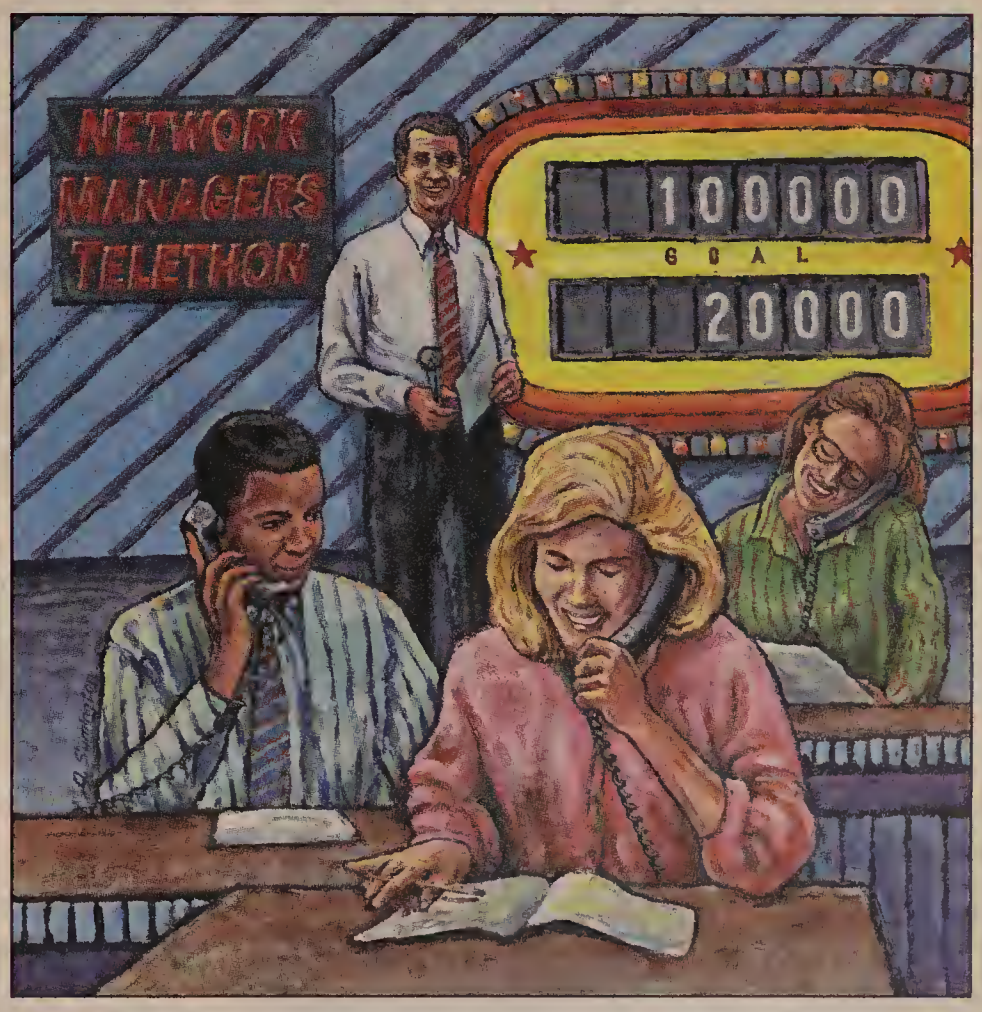


Overall budgets have dropped from $7.10 million in 1992 to $7.07 million in 1993, a decrease of .4 %.

ILLUSTRATION ©1992 GARY SYMINGTON

(continued from page 69)
anyway. We're moving to client/server applications because we can get more expedient development. We can be more responsive to our users' needs and better price/performance by moving to PC-based as opposed to minicomputer-based applications."

Another reason behind the dip in network spending is that many firms simply have fewer end users to support. Due to the sour economy, many companies have been forced to lay off workers, resulting in fewer users needing network services.

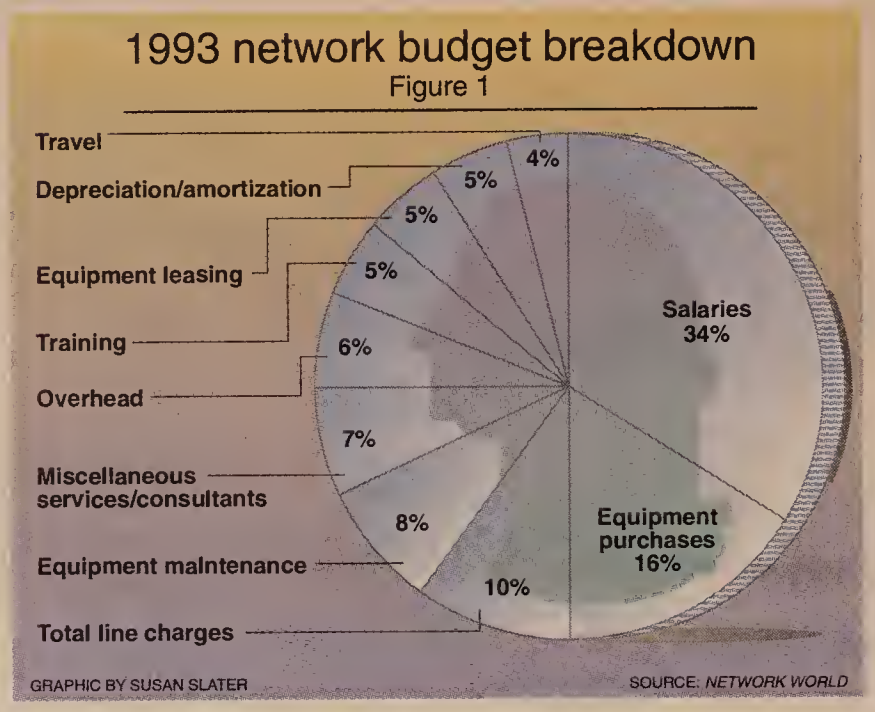
"The bottom line [for network budgets] is shrinking because these companies are shrinking," says Kenneth Phillips, chairman of the Committee of Corporate Telecommunications Users and vice-president of the Office of Telecommunications Policy at Citicorp. "The number of employees is lower, so the bottom line goes down."

Penny-pinching advice

Because most companies aren't expecting the economy to turn around quickly, they are planning to rein in expenditures across the board.

"There will be more pressure to reduce costs [next year]," says John Crankshaw, manager of telecommunications at Steelcase, Inc., a furniture manufacturer in Grand Rapids, Mich.

Crankshaw says Steelcase recently moved from a network of dedicated 9.6K bit/sec lines to fractional T-1 services. "That's reduced our [line] costs by 20%," he says.



The company also plans to utilize competitive bidding as a means to further reduce costs. "We're changing some network vendors so that we can get the same service at a lower cost," Crankshaw adds. "Just looking for better bargains is an effective cost-cutting technique."

This cost containment holds true for managers in other companies, as well. In fact, when the total budget for next year is broken down, the percentages allocated to various items are expected to remain relatively stable (see Figure 1, this page). The only changes planned are minor, such as trimming overhead expenditures from 7% to 6% and boosting miscellaneous services/consultants expenses slightly from 6% to 7%.

Toeing the line

Line charges, which are expected to eat up 10% of next year's budget, have also remained relatively stable as far as the amount allocated to local and long-distance charges.

For 1993, net managers plan to spend 58% of the total amount set aside for line charges on long-distance offerings and 42% on local services. By contrast, managers this year spent 59% of the money allocated to line charges on long-haul services and 41% on local services.

Managers are also hoping to save some money by charging back communications services to end-user departments. Next year, almost half of the network managers surveyed plan to charge back to departments about 66% of the services they provide.

> "Just looking for better bargains is an effective cost-cutting technique," Crankshaw says.
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This is a slight increase over the average 64% of the total network budget charged back last year, a sign that managers are increasingly using chargebacks as a way of passing on expenses to other departments.

In addition to being forced to hunt for ways to save money, managers are facing increased pressure to justify equipment purchases as upper management requires tighter payback periods.

In the survey, 83.3% of the net managers planning major net purchases during 1993 say they expect to face tighter payback periods. Most managers currently must prove the purchase can pay for itself in 21 months, which is three months shorter than last year's average payback period of 24 months.

"In general, we have shorter payback times on new projects," says Shearman & Sterling's West. "Payback periods of three to four years are a thing of the past. We're looking at 15 to 18 months or less."

American Express' Cordo agrees. "We will be spending some money, but it will most definitely be cost-justifiable with a real quick, significant payback," he says.

In addition, the types of equipment that managers plan to purchase in 1993 are virtually identical to the gear they budgeted for last year.

Like last year, managers are spending the lion's share of their capital equipment budgets on LAN equipment such as servers and network operating systems, followed closely by LAN interconnection gear such as bridges, routers and gateways, and voice-related products such as private branch exchanges and voice processing equipment (see graphic, page 1).

Users agree strongly that distributed LANs provide the communications fabric necessary to provide faster service to customers while also allowing net managers to reduce their payback periods.

The other major benefit of LANs and internetworks is that users can significantly reduce application development time, which allows them to respond more quickly to changing market conditions.

Growth industries

About half of the industries surveyed are projecting growth in their network budgets, ranging from just 3% for those in the manufacturing industry to as much as 24% in the insurance industry (see Figure 2, this page).

> "Payback periods of three to four years are a thing of the past," West says.
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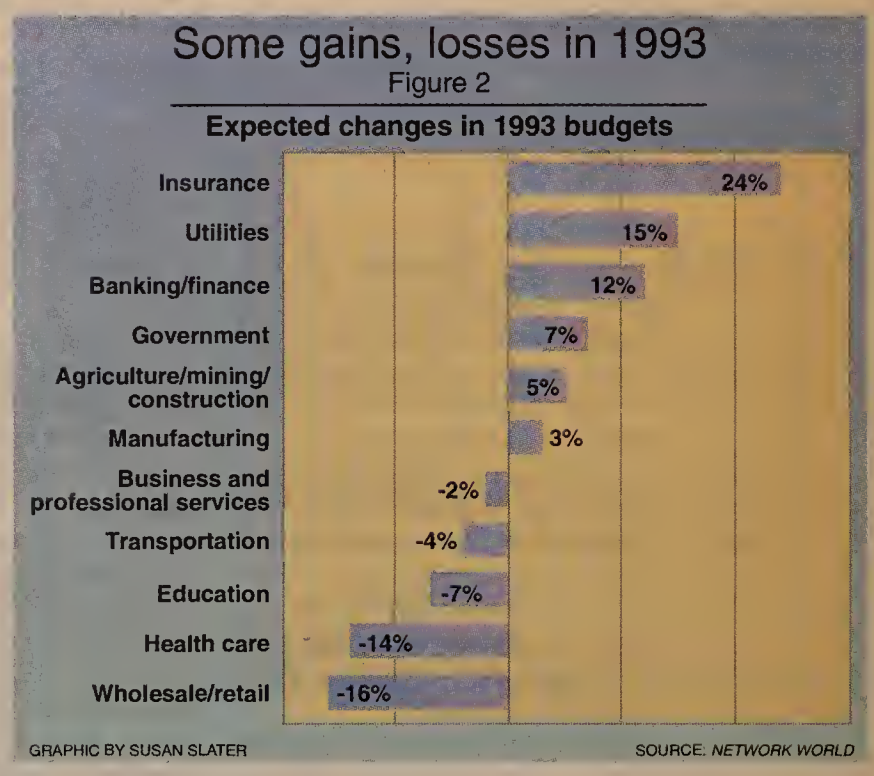


According to John Puckett, manager of engineering and network services at The Foxboro Co., a manufacturer of process control instrumentation based in Foxboro, Mass., the manufacturing industry is increasing network spending because it is the only way it can stay competitive in a tough market.

"A lot of companies are realizing that if they are going to stay in business and be competitive in the manufacturing world, they have to make major changes in the manufacturing process," Puckett says. "Typically, [U.S.] manufacturing is far behind the rest of the world, so companies are dedicating all their resources to improving their manufacturing processes."

According to Puckett, these improvements include the ability to integrate information in real time from the shop floor into executive decision systems at the

Conducting the 1992 budget survey

The 1992 *Network World* budget survey investigates budget trends of networking technology's leading users.

This year's survey is based on 309 responses from a randomly selected sample of 2,000 network managers who subscribe to *Network World*. This yielded a response rate of 15.5%.

To gain a statistically representative sampling of network users, we selected company sites from many industries and regions.

Only those at user organizations who specified, recommended or approved $500,000 or more for networking equipment and services during the past 12 months were invited to participate.

In addition to direct questions about budgets, the survey asked about capital expenditures, organizational structure and to what extent the economy was delaying projects or making managers reduce the time required for a project to return the investment.

Information collection

Survey respondents answered questions posed to them from a disk-based questionnaire. As respondents entered their answers, the information was stored on a 3½-in. floppy disk. A postage-paid diskette reply envelope was provided with each questionnaire.

Under the direction of *Network World* Research Manager Ann MacKay, answers from the returned disks were compiled into one database, where it was then averaged and cross-tabulated by region, vertical industry and the size of the company's network operating budget.

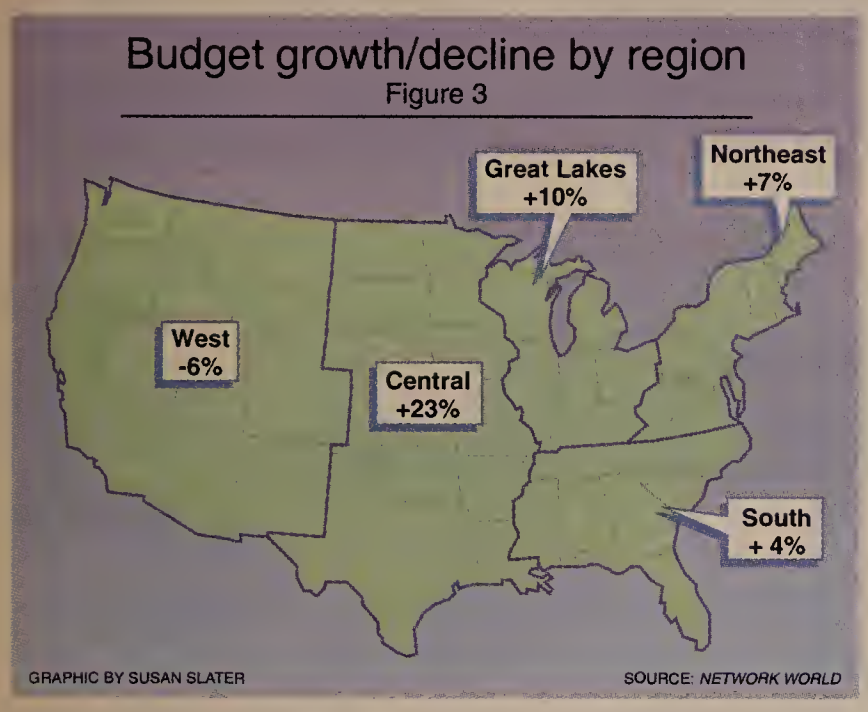
Since completing the budget study took 20 minutes on average, our readers contributed a total of about 103 hours to the project. For their time and effort, *Network World* extends its gratitude.

— Joanne Cummings

boardroom level.

"The people in the boardroom might want to know how many of the business units are running on target, how many barrels of oil they are producing on a specific day or what the status of their inventory is," Puckett says.

The network is an information tool, he adds. "The whole emphasis is on speeding the process of information so you can accelerate the process of making informed decisions."



However, Puckett says The Foxboro Co.'s network budget will probably increase little, if at all, because the company invested in these areas in previous years.

"I think our budget will be flat next year," Puckett says. "There may be a slight increase in our networking budget, simply because of a greater reliance on networking today to run our business, but it won't be substantial."

According to the survey, most companies anticipating budget increases are planning to spend on LAN and LAN interconnection equipment.

> Most companies anticipating increases are planning to spend on LAN equipment.
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For example, companies in the manufacturing industry plan to spend 52% of their 1993 budgets on LAN and LAN interconnection capital equipment, whereas insurance firms plan to spend almost half of their '93 budget, or 47%, on LANs and LAN interconnection.

In addition, the survey found that most companies planning growth, especially insurance companies, will allocate greater portions of their budget in 1993 to data and video equipment and services at the expense of voice-related items.

However, business and professional services showed the greatest difference, decreasing voice spending by 15%, while increasing spending on data by 11%. This is a trend that was fairly consistent across all industries, however (see Figure 4, this page).

Members of the banking/financial services industry, who are expecting to increase budgets by an average of 12%, are typical of next year's spenders. Key players in the industry say they are budgeting for more LAN equipment because that is where they see the greatest return on investment in the shortest amount of time.

"We seem to be in a very progressive mode of business, and we're enjoying growth where other people aren't," says a network manager at a major New York brokerage firm who requested anonymity.

The manager says his company, in general, tends to spend more money on networks because it considers itself technologically progressive.

"We are investing money in LANs, and we're even working to bring LANs to our customers' desktops because we're willing to make the investment where we see a significant benefit."

Network managers in banking/financial services also tend to be more optimistic about the economy than managers in other industries, with half saying they expect economic conditions to improve next year.

"We've come from a period of absolute depression around 1987 and are well on the rebound," says the brokerage firm manager. "In our business, we're on the upswing, and my prognosis is that things will get better."

Gloomier prospects

Unfortunately, some industries have gloomier prospects. Those in the wholesale/retail, health care, education, transportation and business and professional services sectors are making cuts in their network budgets for next year, some by as much as 16%.

"Our budget is going down," says American Express' Cordo. "We're dependent on consumers, and people aren't out spending money. We anticipated a quicker turnaround in the economy, but it's been slow."

In addition, Cordo says gaining approval for net expenditures is becoming more difficult. "There are a lot of highly sophisticated pieces of diagnostic equipment that may cost about $20,000 or $25,000," he says. "In the past, we've been able to buy that kind of equipment with very little justification. Today, we're taking a lot longer look at approving that kind of money."

Cordo says it is less of a problem getting approval for products such as software that improves network response time. "You can only get things that will improve service."

According to the survey, the senior ranking member of the network department can approve equipment expenditures of up to $27,000, on average, without the need for approval from corporate headquarters or the MIS department, to which the networking department reports in more than half of the sites surveyed. And that dollar figure has increased over last year's amount in almost two-thirds of the sites surveyed.

Regional demarcations

When segmented by region, network managers' responses appear a bit more positive than those reflecting specific industry breakouts.

Of the five regions surveyed, only the West is planning budget cuts, lopping off an average of 6% (see Figure 3, this page). Although the survey respondents don't detail the reasons for such a large cut in expenditures, it can probably be traced to the general lack of business growth in that region.

The rest of the regions are planning significant growth in net spending, ranging from 4% growth in the South to as much as 23% in the Central U.S.

One manager for a large Southern company says, "We're sort of out of the norm. I guess a lot of companies are experiencing some downsizing and that type of thing, but we haven't. I anticipate that we will have a lot of expansion going on from a communications standpoint, and we definitely will have an increase in our budget for next year."

He attributes his company's good fortune to its reliance on global rather than U.S.-based markets because consumers in other countries such as Japan are not experiencing as large an economic slowdown as those in the U.S. Thus, foreign-based revenues are on an upswing, rather than a decline.

The regional breakdowns make it appear as though the vast majority of users are increasing their budgets. This happens because the responses from some of the regions created statistically small samples. In small samples, one or two companies that report big increases can boost the overall average even when the rest of the companies report only modest jumps.

The prognosis

All in all, some network managers will be tightening their belts a notch or two next year, while others will be loosening theirs a bit.

> "We're on the upswing, and my prognosis is that things will get better."
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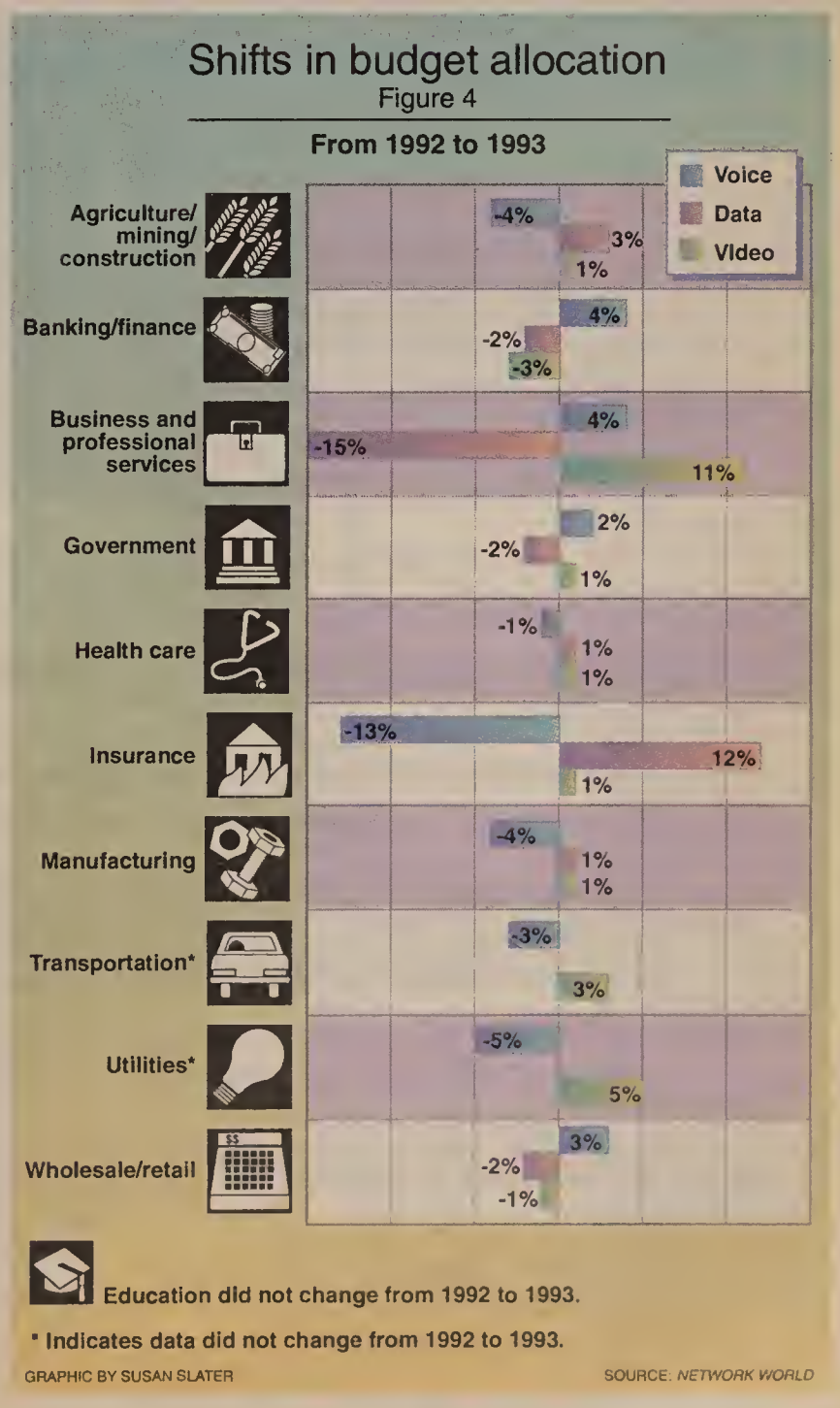
Many companies have already completed rounds of layoffs and will see some financial strains easing as a result. But the numbers show that many are still being forced to make cuts or keep network spending at the same level.

"For now, staffing is very flat," says American Express' Cordo. "Hopefully, things will pick up and [more cuts] won't be necessary."

Cummings is Network World's *senior writer for management strategies.*



Switch-to-host interfaces (continued on page 86)

Company	Product	Switch	Host environment	Interim processor	Protocol	API (D = DEC's CIT T = Tandem's CAM H = HP's ACT O = Other I = IBM's CSA)	Application sources: Vendor	Application sources: Independent software vendors	Applications: Inbound call routing	Applications: Outbound call management	Applications: Coordinated screen transfer	Applications: Database inquiry and access	Applications: Management report creation	Applications: Other	Application tool kit	Strategic alliances: AT&T	Strategic alliances: Digital Equipment Corp.	Strategic alliances: Hewlett-Packard Co.	Strategic alliances: IBM	Strategic alliances: Northern Telecom, Inc.	Strategic alliances: Stratus Computer, Inc.	Strategic alliances: Tandem Computers, Inc.	Strategic alliances: Other	Warranty (Months)	Price
Aspect Telecommunications (800) 541-7799	Application Bridge	Aspect CallCenter ACD	HI	✔	X.25	D, T, O		✔	✔	✔	✔	✔	✔	✔			✔		✔				✔	12	$25,000
AT&T (800) 247-1212	AT&T CallVisor ASAI	AT&T Definity Communications System Generic 3	HI		BRI	O		✔	✔	✔	✔	✔	✔		✔		✔	✔	✔		✔	✔	✔	12	$50,000
	AT&T CallVisor ASAI Gateway	AT&T System 85, Definity Communications System Generic 2	HI	✔	X.25, PRI	O		✔	✔	✔	✔	✔	✔		✔		✔	✔	✔		✔	✔	✔	12	$50,000
	AT&T CallVisor ISDN Gateway	AT&T System 85, Definity Communications System Generic 1 or 2	HI	✔	X.25	O		✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔	✔	✔	12	$20,000
Digital Equipment Corp. (800) 332-4636	CIT	AT&T Definity, Ericsson MD110, Northern Telecom Meridian 1 and DMS 100, Mitel SX-2000, Rolm 9750, Siemens Private Communications System Hicom 300, Aspect CallCenter ACD, Rockwell International Corp. Galaxy	DEC VAX	✔	X.25, BRI, HCI, LAP B, LU 6.2	D	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔				✔			✔	Varies	$9,800-$51,500
Ericsson Business Communications, Inc. (800) 374-2776	MD110 ApplicationLink	Ericsson MD110 Communication System	IBM PS/2, AS/400, DEC VAX	✔	X.25	D, I, O		✔	✔	✔	✔	✔	✔		✔		✔		✔				✔	12	$45,000
Executone Information Systems, Inc. (203) 655-6500	Executone Integrated Digital System	Executone Integrated Digital System PBX	HI		Asynchronous data			✔	✔	✔	✔	✔	✔											12	$8,000-$15,000
Fujitsu Business Communication Systems (800) 553-3263	Telecommunications Computer Services Interface	Fujitsu 9600 ISDN Platform PBX	All IBM computers, DEC VAX, Tandem Non-Stop Systems, -HP HP3000 and HP 9000	✔	Proprietary, LAP B	D, H, I, T	✔	✔	✔	✔	✔	✔	✔										✔	12	$5,000-$15,000
Harris Digital Telephone Systems (800) 888-3763	Harris VoiceFrame	Harris VoiceFrame M, LH and L	HI		Asynchronous data	O	✔		✔	✔	✔	✔	✔	✔	✔		✔						✔	18	$9,000
Hewlett-Packard Co. (408) 447-3167	HP 32046A ACT API for HP9000	Definity Generic 3, Meridian 1	HP9000	✔	ISDN, X.25	H	✔		✔	✔						✔			✔				3	$30,500-$50,000
	HP 32077A ACT API for HP3000	Definity Generic 3, Meridian 1	HP3000	✔	ISDN, X.25	H	✔		✔	✔						✔			✔				3	$32,000-$51,000
IBM (914) 288-3474	CallPath/2, CallPath/DOS for Windows	Definity Generic 2 and 3, NEC APEX/NEAX 2400 IMS, Meridian 1, Rolm 9751, Siemens Hicom 300	PS/2	✔	X.25, LAP B, TCP/IP, BRI, LU 6.2	I	✔		✔	✔	✔	✔	✔		✔									6	$1,350-$6,600
	CallPath CallCoordinator/2	Definity Generic 2 and 3, NEC APEX/NEAX 2400 IMS, Meridian 1, Rolm 9751, Siemens Hicom 300	PS/2	✔	X.25, LAP B, TCP/IP, BRI, LU 6.2	I	✔		✔	✔	✔	✔	✔		✔									6	$13,400
	CallPath CallCoordinator CICS/MVS	Definity Generic 2 and 3, NEC APEX/NEAX 2400 IMS, Meridian 1, Rolm 9751, Siemens Hicom 300	IBM S/370, S/390	✔	X.25, LAP B, TCP/IP, BRI, LU 6.2	I	✔		✔	✔	✔	✔	✔		✔									36	$2,118-$106,710
	CallPath CICS/MVS and CallPath CICS/VSE	Definity Generic 2 and 3, NEC APEX/NEAX 2400 IMS, Meridian 1, Rolm 9751, Siemens Hicom 300	S/370, S/390	✔	X.25, LAP B, TCP/IP, BRI, LU 6.2	I	✔		✔	✔	✔	✔	✔		✔									36	$236-$11,885
	CallPath/400	Definity Generic 2 and 3, Meridian 1, Rolm 9751, Siemens Hicom 300, NEC APEX/NEAX 2400 IMS, Northern Telecom DMS100	IBM AS/400	✔	X.25, LAP B, TCP/IP, BRI, LU 6.2	I	✔		✔	✔	✔	✔	✔		✔									36	$2,080-$53,800
InteCom, Inc. (800) 468-3266	Open Applications Interface	InteCom IBX, Telari PBX	PS/2, RS/6000, DEC VAX	✔	Proprietary, asynchronous data	O	✔	✔	✔	✔		✔	✔	✔	✔		✔		✔				✔	12	$4,000-$15,000
Mitel Corp. (800) 648-3579	Call Center Manager	Mitel SX-2000, SX-200 Digital	Any 80486 PC		HCI		✔		✔	✔	✔	✔	✔		✔								✔	12	$26,000
	ACD Supervision	Mitel SX-2000 PBX with ACD	Any 80486 PC		HCI		✔		✔	✔	✔	✔	✔		✔									12	$31,000
	Host Command Interface	Mitel SX-2000 PBXs	DEC VAX		HCI	D		✔	✔	✔	✔	✔	✔		✔									12	$6,000
NEC America, Inc. (516) 753-7570	Open Applications Interface	NEC NEAX	HI	✔	TCP/IP, X.25	O			✔	✔	✔	✔	✔		✔									3	$10,000-$25,000
Northern Telecom, Inc. (800) 667-8437	Meridian Link	Meridian 1	AS/400, S/370, S/390, PS/2, any IBM-compatible PC, HP9000, HP3000, Tandem Non-Stop Systems, Novell, Inc. LANs		X.25, LAP B	D, H, I, T	✔	✔	✔	✔	✔	✔	✔		✔		✔	✔				✔	✔	Varies	$27,500

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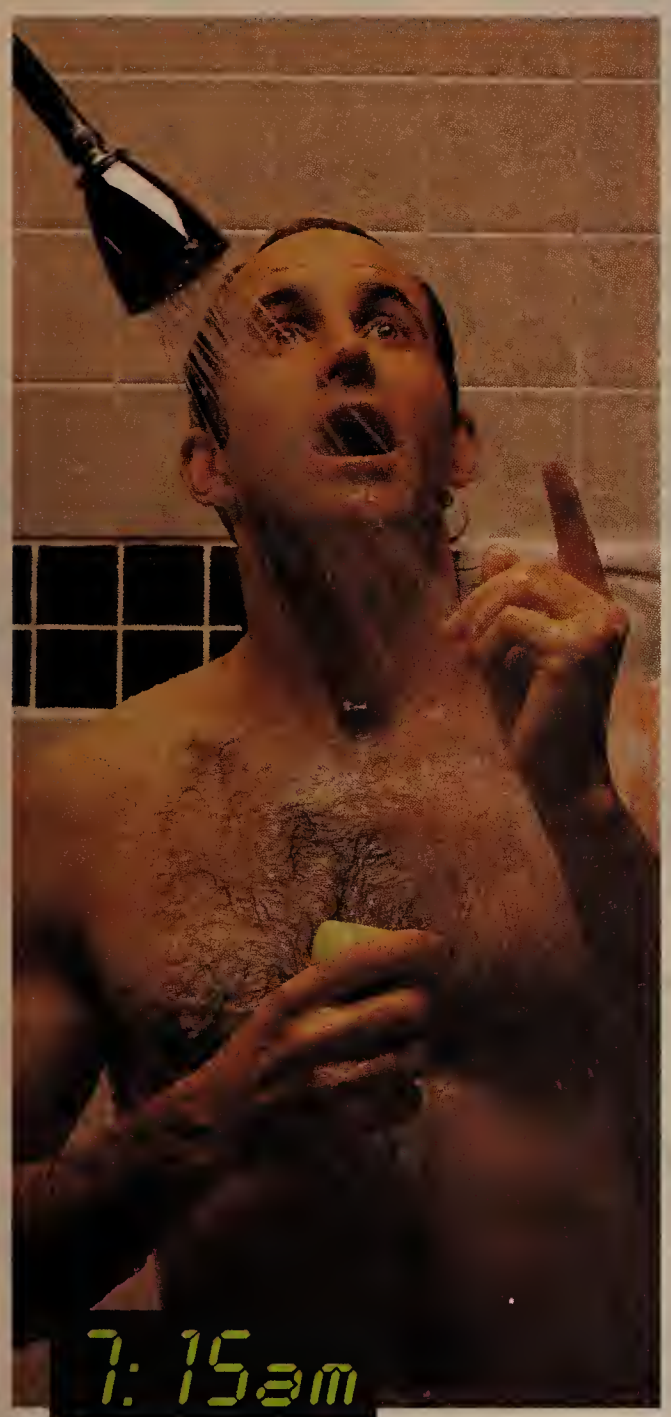

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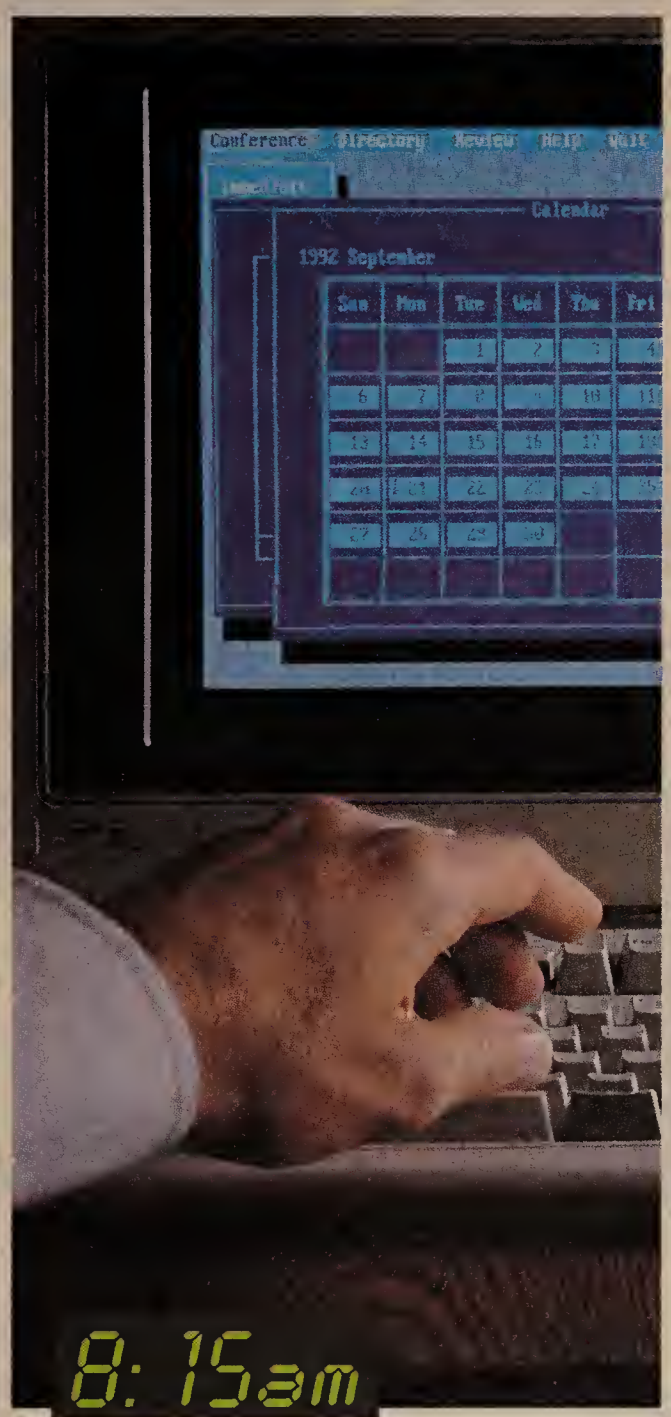

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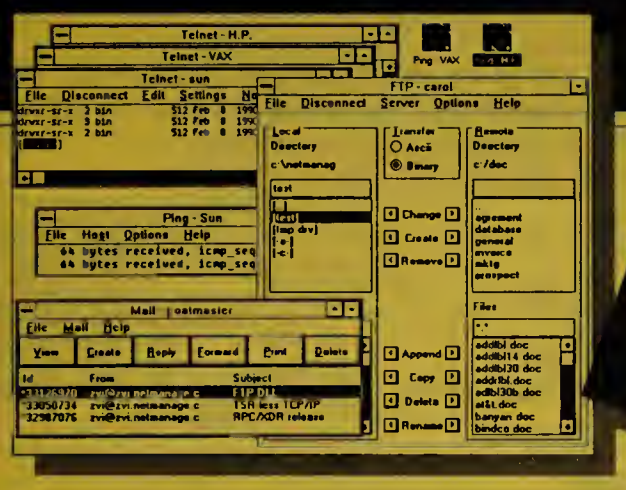

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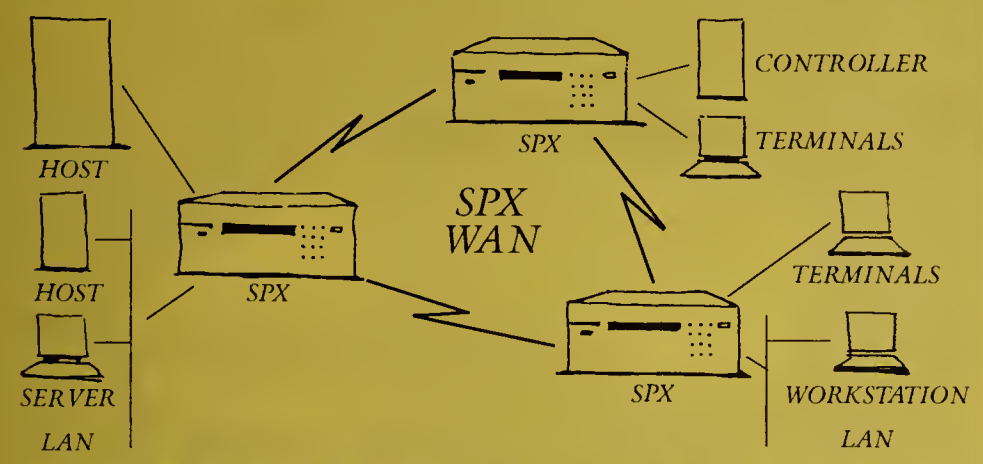

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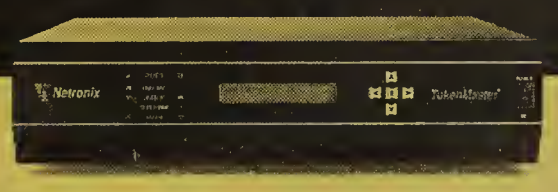

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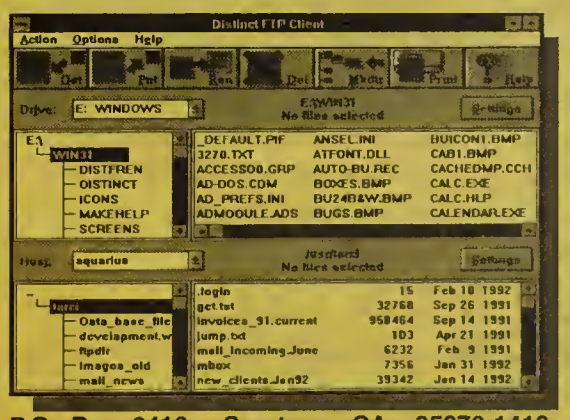

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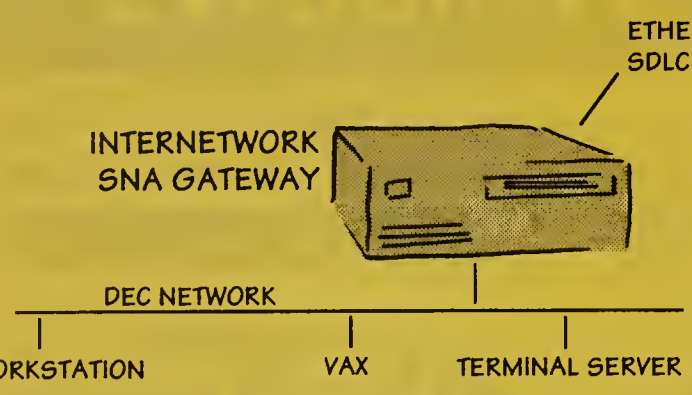

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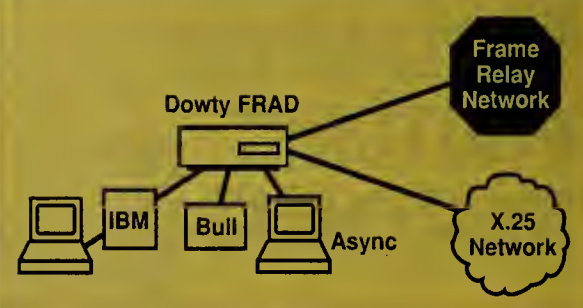

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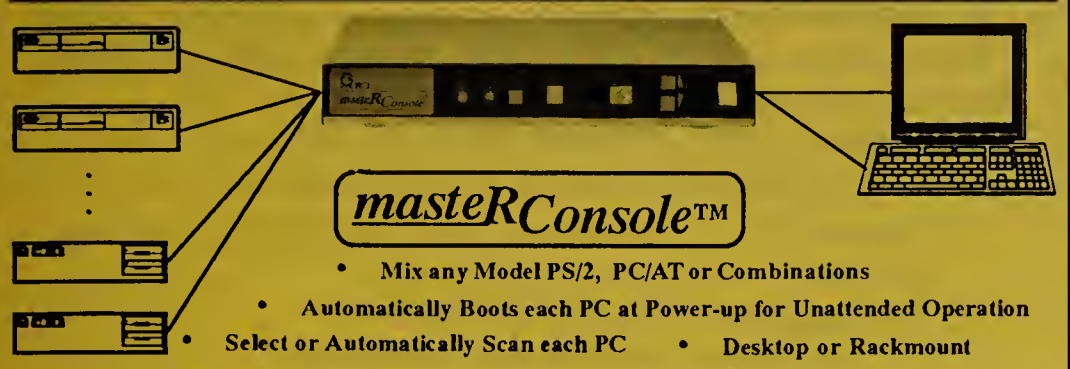

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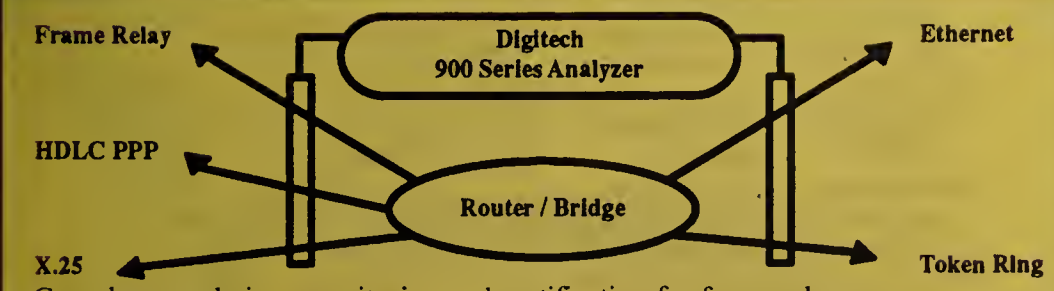

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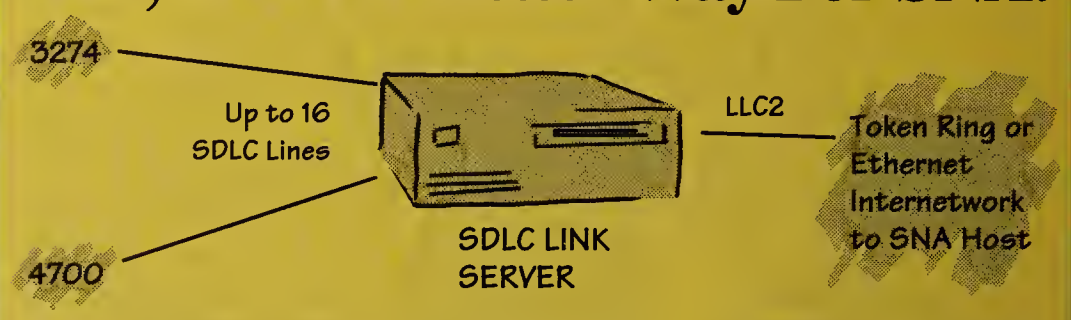

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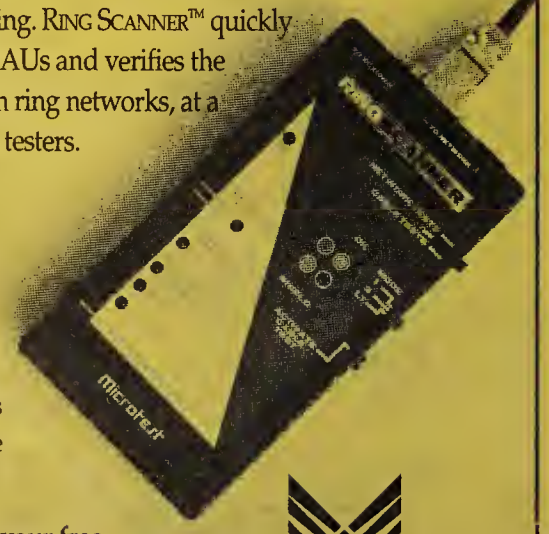

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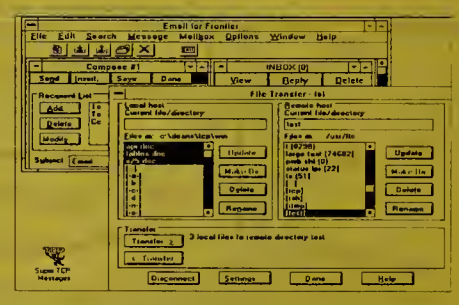

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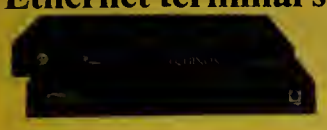

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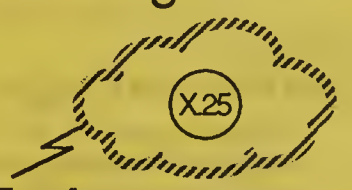

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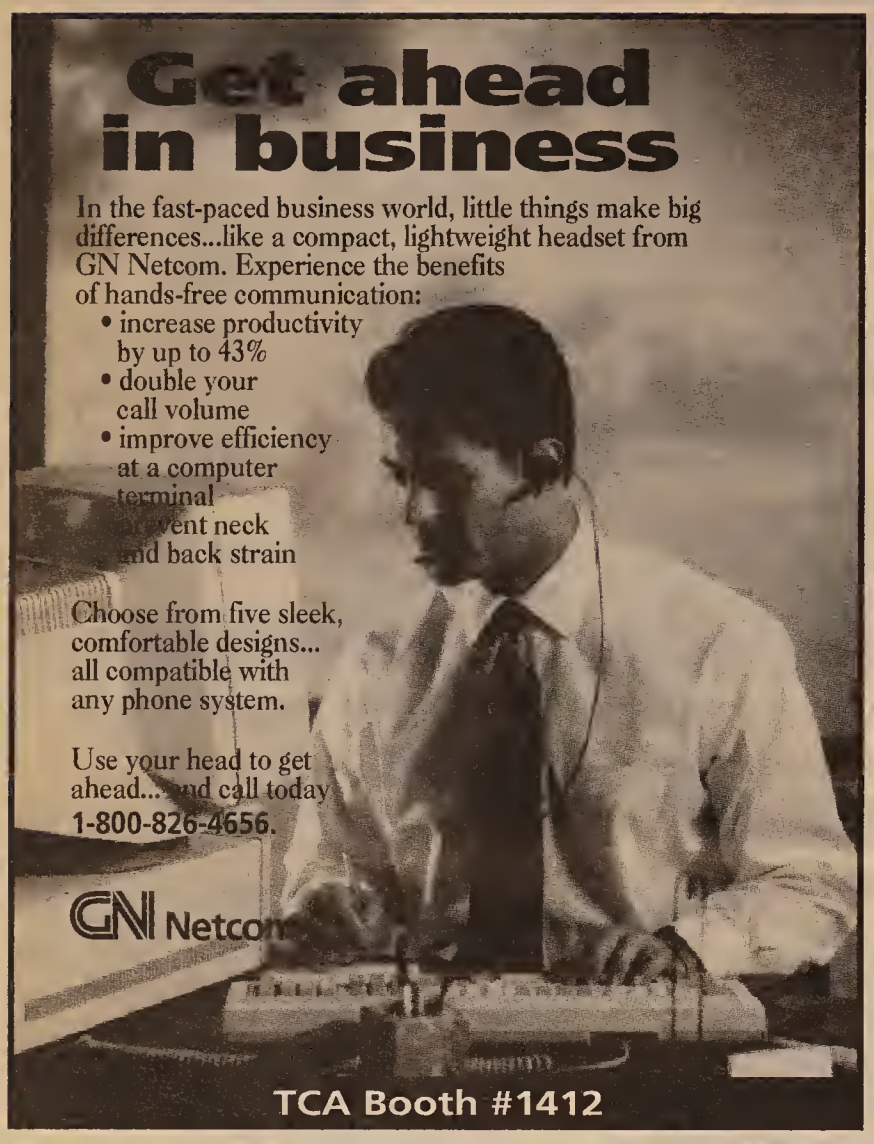

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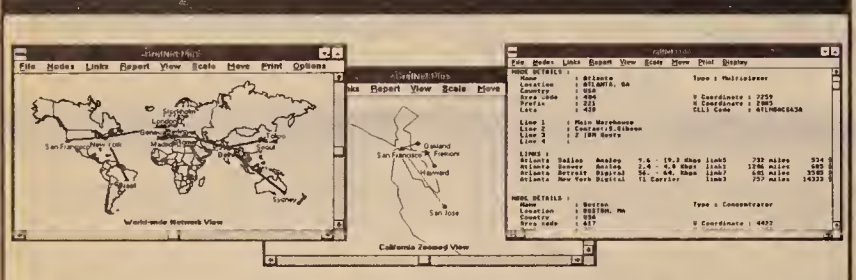

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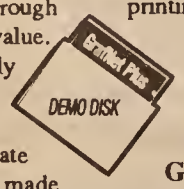

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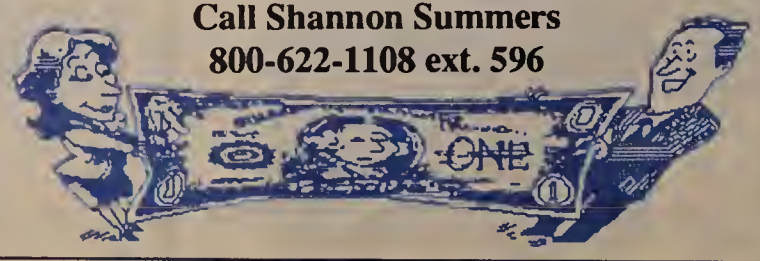

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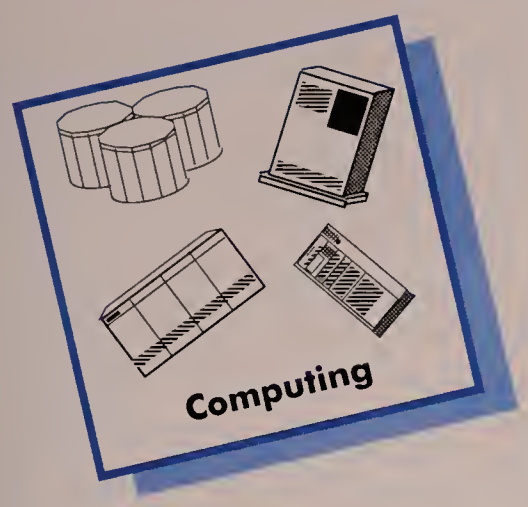

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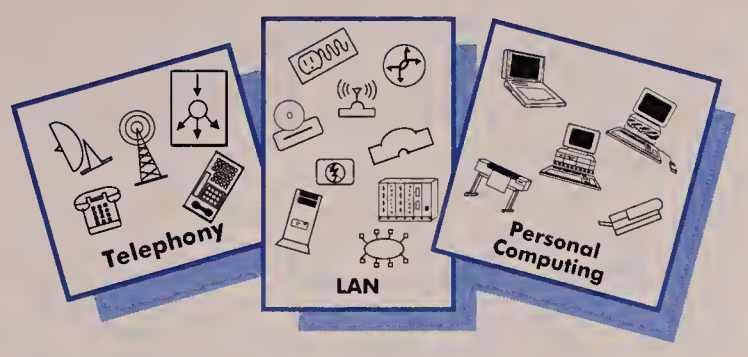

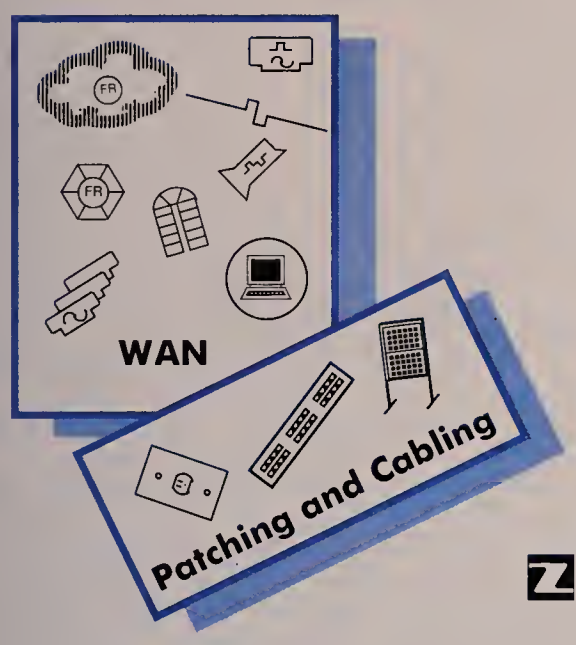

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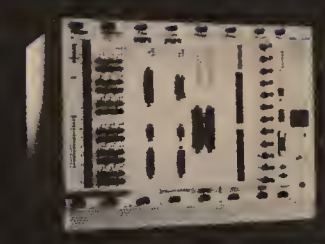
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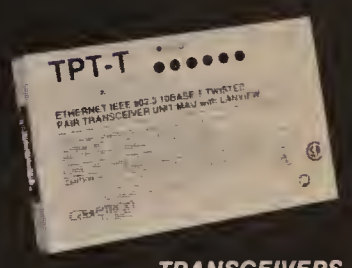

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Nov 2 (Oct 21 Close); Topic: LAN; Wireless LANs

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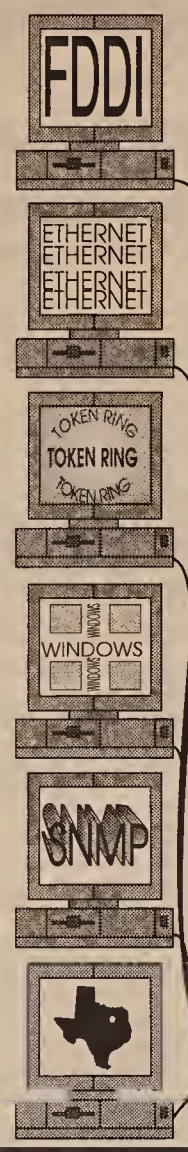

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Switch-to-host interfaces (continued from page 72)

Company	Product	Switch	Host environment	Interim processor	Protocol	API (D = DEC's CIT T = Tandem's CAM H = HP's ACT O = Other I = IBM's CSA)	Application sources: Vendor	Application sources: Independent software vendors	Applications: Inbound call routing	Outbound call management	Coordinated screen transfer	Database inquiry and access	Management report creation	Other	Application tool kit	Strategic alliances: AT&T	Digital Equipment Corp.	Hewlett-Packard Co.	IBM	Northern Telecom, Inc.	Stratus Computer, Inc.	Tandem Computers, Inc.	Other	Warranty (Months)	Price
Rockwell International Corp. (708) 960-8490	Transaction Link	Rockwell Galaxy ACD and Spectrum Integrated Call Center	All major computers		X.25, SNA/SDLC, LU 6.2	O		✔	✔	✔	✔	✔	✔		✔							✔	✔	12	$12,000
	Contact Gateway II	Galaxy ACD and Spectrum Integrated Call Center System	All major computers		X.25, SNA/SDLC, LU 6.2	O		✔	✔	✔	✔	✔	✔		✔							✔	✔	12	$110,000-$500,000
Rolm (408) 986-1000	CallBridge	Rolm 9751 CBX	IBM 3090, PS/2, AS/400, VAX, Tandem Non-Stop Systems	✔	LU 6.2, X.25	D, I, T		✔	✔	✔	✔	✔	✔		✔		✔		✔			✔		12	$25,000-$40,000
Summa Four, Inc. (603) 625-4050	Summa Four SDS	Summa Four SDS Series	HI		ADLC, TCP/IP	O		✔	✔	✔	✔	✔	✔	✔	✔								✔	12	$35,000-$450,000
Teknekron Infoswitch Corp. (817) 267-3025	InfoExchange	Teknekron ACD	AS/400, IBM S/34, S/36, S/38, DEC VAX		Asynchronous, X.25, LU 6.2, SNA/SDLC	O	✔		✔	✔	✔	✔	✔	✔										12	$10,000

ACD = Automatic call distributor
ACT = Applied Computerized Telephony
BRI = Basic Rate Interface
CAM = Call Applications Manager
CIT = Computer-Integrated Telephony
CSA = CallPath Services Architecture
HCI = Host Command Interface
HI = Host-independent
LAP = Link Access Procedure
NA = Not applicable
PRI = Primary Rate Interface
SDS = Specialty Digital Switching System

SOURCE : ROBINS PRESS, NEW YORK

(continued from page 64)
provide telephone operators with screen-based PBX console functions and advanced messaging capabilities that interact with the host switch."

Whatever the future of SCI may hold, it is clear that today's applications can deliver a number of important benefits to users. For those who make the investment, SCI technology can provide a competitive edge. Results can be measured in increased revenues, lower costs and improved efficiency — especially in call center environments where agents can handle more incoming calls, place outgoing calls more accurately, process orders and handle collections more effectively, and generally provide a much higher level of personalized customer service.

With these kinds of results, telecommunications and computing resources can be run as revenue-generating profit centers rather than traditional cost centers.

Robins is president of Robins Press, a New York-based publishing, market intelligence and consulting firm specializing in the voice and fax processing marketplace, as well as other integrated voice/data technologies. He may be reached at (212) 614-9842.

Early user says rewards of SCI software great

One early user of switch-to-computer interface (SCI) software is reaping big rewards.

US Teledata, an Atlanta-based telemarketing and operator services company, has integrated its Harris Corp. VoiceFrame switches with a Tandem Computers, Inc. host.

The setup is one of the first truly integrated voice/data processing systems that allows customer service and inbound telemarketing agents to handle both the voice and data portions of a call at the same time, according to Frank Gruber, US Teledata's vice-president of operations.

US Teledata's 380 operators now process some 2 million calls per month through the company's call centers in Atlanta and Dallas. The heart of this voice information processing environment is the company's homegrown UltraPath software, which permits three VoiceFrames to link with a single fault-tolerant host.

While a voice call is routed via VoiceFrame's automatic call distribution (ACD) system to the appropriate agent, the call's automatic number identification (ANI) or dialed number identification service (DNIS) information is handed over a data link to the host. This means information such as the caller's telephone number, account codes and buying preferences appears on the agent's terminal as the call is fielded.

US Teledata also designed its call processing system to let agents handle a variety of caller requests. This has proved to be much more effective than limiting customer service agents to specific lines of business.

US Teledata's client roster ranges from interexchange carriers such as ATC Microtel, for which US Teledata provides services, including call status reporting, billing and operator services; to banks, for credit card authorization and cash management services; and to telemarketing for such large corporations as The Coca-Cola Co., for which it provides inbound and outbound telemarketing as well as customer surveying.

> The system lets agents handle a variety of caller requests.
>
> ▲▲▲

For US Teledata, the VoiceFrame switches serve as communications controllers that handle inbound and outbound telephone traffic under computer control. VoiceFrame interprets inbound calls from the telephone network and translates the information to protocols understood by the Tandem host. It also takes commands from the host and interprets them as call actions, and then executes them to switch, route and complete outbound calls.

The Tandem host, meanwhile, provides real-time database investigation, alternate ANI and DNIS routing and various application processes, such as credit card authorization, cash management and predictive dialing for outbound telemarketing. The computer also captures VoiceFrame data for security, improved call setup, call traffic accounting and data processing accounting. The computer's fault-tolerant capabilities are especially necessary for real-time financial processing applications, such as telebanking, cash management and credit card verification.

Meanwhile, the switch's intelligence supports a great amount of programmability. Applications reside as high-level switching commands stored on its hard disk.

The switch and the host are connected via a host-interface link (HIL). This two-way pipeline, a software component of VoiceFrame, supports communications at 9.6K bit/sec over an RS-232 interface. US Teledata currently uses HILs to connect each of its three VoiceFrames with its Tandem host and database.

The HILs are critical to US Teledata's success. Via this method, the company's host computer can communicate with VoiceFrames anywhere, so the company can easily expand the reach and amount of its enhanced services offerings.

Also crucial to US Teledata's growth strategy is the high-speed X.25 link Harris is readying for its VoiceFrame product. "With an X.25 link, we will be able to control an entire network of switches in real time all over the country from a single point," Gruber says.

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Falcon
Network Integration

SNA issues coming to the fore

continued from page 25

process is getting SDLC traffic onto the multiprotocol local-area network internet backbone. Most of the router vendors, including Cisco, 3Com Corp. and Wellfleet Communications, Inc., are or will be providing some level of direct SDLC connection to the router. That typically involves encapsulating SDLC in another protocol, such as the Internet Protocol, for transmission over the backbone (see graphic, page 25).

According to Kevin Tolly, president of the Interlab, a testing and consulting firm in Sea Girt, N.J., SDLC conversion is a strategic offering that vendors need to provide, although it does have limitations. Among its drawbacks is the need for a direct front-end processor (FEP) connection, which can be more expensive than using token ring, he explained.

> The SDLC connection cost on a router is typically more expensive than on a separate conversion device, Barton said.
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A more strategic option, and a more controversial one, as well, is SDLC conversion. Here, router vendors are increasingly looking to pair with vendors of SDLC-to-802.2 Logical Link Control 2 (LLC2) conversion devices, such as Sync Research and Ring Access, Inc.

Such products attach to token-ring LANs and support SDLC links to devices such as cluster controllers. The device strips SDLC headers off incoming data packets and replaces them with LLC2 headers, allowing the traffic to be handled on the ring and over the backbone, the same as any other LAN traffic.

Spokesmen for both Sync and Ring Access acknowledged that their companies have been discussing formal comarketing or other relationships with router vendors.

Sync expects to announce a deal with at least one router vendor and a hub manufacturer by INTEROP 92 Fall, which will be held next month, said Lynn Nye, director of product marketing for the company. Those deals will involve a new board-level version of Sync's SNAC/Token Ring Converter product that will fit into devices such as hubs, bridge/routers and T-1 multiplexers, Nye said.

But 3Com and Wellfleet Communications are already espousing the use of these separate conversion devices in conjunction with routers to perform SDLC-to-LLC2 conversion.

Karen Barton, Wellfleet's director of business development, said using conversion devices has cost, performance and management advantages over other approaches such as building conversion capabilities into the router itself.

The SDLC connection cost on a router is typically more expensive than on a separate conversion device, and vendors of such devices are moving aggressively to further lower that cost, Barton said. Performance is also an issue in that requiring a router designed to handle LAN traffic to also handle SDLC traffic can compromise its performance for both, she said.

Finally, conversion devices generally have better NetView connections than routers do, she said.

Michael Zadikian, SNA product manager for Cisco, said his company opted for the integrated approach because it protects users' investments in that they will not get stuck with an extra box as they move away from SDLC. Instead, users can just reconfigure their router to support other protocols. It also means fewer points of failure, he said.

Setting priorities

The next hot area of SNA routing appears to be the adoption of SNA PU Type 4 properties, such as Class of Service, which enable net managers to give SNA traffic special priority to ensure good response times.

Cisco and CrossComm are the first two router vendors to jump into this area, and Wellfleet plans to announce and ship this capability imminently.

Interlab's Tolly said router vendors' prioritization schemes are at too early a stage to compare them.

Cisco's newly announced capabilities will let users prioritize traffic based not only on packet size, protocol and port number, but also according to the device generating the SNA traffic. For example, FEP-to-FEP traffic can be given top priority, while traffic generated by different cluster controllers and terminals can be given different prioritization with respect to one another.

Although Wellfleet is not providing details on its strategy yet, Barton said the company's prioritization capabilities will let users "establish priority on the basis of almost any field inside the packet."

3Com will not provide prioritization until it comes out with APPN-compliant products next year, said Alan Kessler, a 3Com vice-president and general manager of the company's Network Systems Division. He said there is no use rushing a prioritization capability to market since there is no standard way to implement it yet.

> APPN-compliant routers are still far down the road for many vendors, but 3Com and IBM will undoubtedly get to market first.
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APPN: the Holy Grail

APPN-compliant routers are still far down the road for many vendors, but 3Com and IBM will undoubtedly get to market first, given that IBM owns the APPN Network Node code and 3Com was one of its two beta testers.

According to Edgar Masri, 3Com's director of business development, his company plans to begin offering APPN support on its routers in the second half of 1993.

By comparison, Cisco does not plan to support APPN until the second half of 1994. However, Cisco next year plans to begin delivering products based on APPI, an APPN-like peer-to-peer networking scheme that Cisco plans to develop in conjunction with a yet-to-be-formed consortium of vendors.

APPI will not only protect Cisco should the company run into problems licensing APPN Network Node code from IBM, but also will offer technical advantages over APPN, such as the choice of a more flexible directory scheme, Zadikian said.

Besides Cisco, 3Com and Proteon are among the first router vendors to indicate support for APPI. Kessler said that even though 3Com will already be out in front with APPN, his company will want to support APPI, as well, if it blooms into an accepted standard.

Test focuses on interoperability

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Clara, Calif., to discuss the adoption of bylaws and coordination of interoperability testing procedures.

The group — which comprises vendors, users and testing laboratories, and is open to new members — was formed to foster interoperability among vendors' implementations of the OSPF routing protocol.

"The industry made a big step forward about a year ago by formalizing the standards for OSPF, and many more vendors are beginning to offer OSPF in their routers," 3Com's Benhamou said. "But it's not enough to simply participate together in creating a standard. We are now going forward to the next important step to make our products interoperate."

The impetus for multivendor OSPF interoperability came largely from user suggestions and, in some cases, user pressures, Benhamou added.

The field of internetworking is expanding at such a rapid clip that customers are now demanding multiple options and refusing to be locked into any particular vendor's products.

Carriers testing voice recognition

continued from page 50

This could delay availability of voice-activated cards from some carriers. Fortunately, the enhanced service platforms that support card applications, such as the Texas Instruments, Inc. MultiServe that Sprint is using, are designed to simultaneously support several applications.

The other hurdle for the voice card — and any other voice recognition technology that depends on identifying a particular speaker's voice — is the amount of computer memory space required to store customer-specific voice prints. Anyone who has ever tried to store sound files on a Macintosh or personal computer knows that it is a megabyte-intensive process.

Sprint is actively working with Texas Instruments, Inc. to overcome this storage problem through data compression techniques. The current size of each voice print is around 2,000 bits.

While voice recognition technology has been in development for more than 30 years, Sprint's Voice FONCard trial is a bellwether, demonstrating that this technology finally works at a basic level and is making its way into carrier networks.

Carriers hope it will be a powerful catalyst moving users toward greater use of overall network intelligence. Most users will find many benefits. Consider, for example, that it could be used for voice print screening to control access to databases, private branch exchanges and virtual networks.

Sprint is planning to build voice recognition intelligence into its network to support a broad base of user applications, such as voice messaging and network-based voice-activated corporate directories and help desks. In fact, the same system employed in the Sprint application is scalable enough to be used in a large private network.

Every company will have its own specific requirements. "The voice card is only the tip of the iceberg for the technology," said John Morrison, vice-president of voice information services at Sears, Roebuck and Co. and a Voice FONCard user for more than a year. He added that he is most excited about speaker-independent applications such as automated information services. Sears, Roebuck is involved in other voice recognition trials with Bell operating companies and customer premises equipment vendors, according to Morrison.

Speaker-independent voice recognition also will serve as an enabling technology for services and features that have been underutilized in the past, due to the fact that users could not access or use them easily. Advanced PBX features and Custom Local Area Signaling Services would be naturals for voice recognition.

A more advanced application could give the caller the choice of automatic call back or message delivery when a station is busy. This form of speech recognition is likely to find its way into automatic call distribution and order-handling applications.

As an example, AT&T has already developed a system in the laboratory that can perform catalog order-taking. So, a direct mail customer could call a catalog firm, speak the item numbers of what needs to be ordered, and then give a credit card number — all through automated voice response.

For end users, the question is when to start relying on this technology and in what applications. The initial market entries are good for certain applications but not for others. That's going to take some education on the end user's part. Users need to acknowledge the deficiencies of today's technology as merely a starting point for tomorrow's development.

Finn is an associate and Briere is president of TeleChoice, Inc.

Proteon packages hub

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console through Proteon's One-View Simple Network Management Protocol-based net management system as well as any other third-party SNMP-based system. It can also be managed from IBM's NetView via Proteon's SNMP-to-NetView Gateway.

The DNX 300m bridge/router module is equipped with a menu-driven configuration system that eliminates the complexity and logistical challenges associated with configuring remote routers.

It supports the same protocols and LAN and WAN interfaces as the higher end 4100+ and CNX 500 bridge/routers. The bridge/router's three slots support any combination of LAN or WAN interface cards, including Ethernet and token ring. On the wide-area side, it supports X.25, frame relay at up to T-1 speeds as well as T-1 interfaces.

The bridge/router supports any combination of four protocols, selecting from a group that includes the Transmission Control Protocol/Internet Protocol, DECnet, Novell, Inc.'s Internetwork Packet Exchange (IPX), Xerox Network Systems, AppleTalk, VINES and Apollo Domain as well as Open Systems Interconnection protocols.

The product supports the transparent, source routing and source routing transparent bridging algorithms as well as Open Shortest Path First routing.

Speeding configuration

The bridge/router is also equipped with a QuickStep Installation System, which enables nontechnical users to install and configure the router in less than 15 minutes, said Nate Kalowski, Proteon's vice-president of marketing.

The hub "is a full-function hub/router that can be installed in less than 10 minutes. It really helps maximize our network administration resources," said John Ferlatte, a technical architect at the Canadian Tire Corp. and Series 90/DNX 300m user.

The Series 90/DNX 300m router/hub is available now and is priced according to configuration. In a configuration with dual WAN ports, the router/hub costs $7,790. Each additional token-ring interface costs $895.

IBM adds array of products

continued from page 1

"They should help users consolidate network traffic where possible and increase network capacity and throughput."

FEP users needing increased performance and capacity got a boost with a new version of the 3745 expansion frame, the 3746 Model 900, which bolts onto existing 3745 Models 210, 310, 410 and 610. It supports the faster Type 3 TICs and Enterprise Systems Connection (ESCON) fiber-optic mainframe channel adapters, also unveiled last week.

The TIC and ESCON cards offload Token-Ring and ESCON communications processing from the 3745's main processor. They can also free up slots on the FEP for additional T-1 links, Type 2 TICs, Ethernet adapters and other boards. IBM said the offload facility in the new TICs alone can save up to 70% of the main processor's cycles.

With ESCON support, users can locate their 3745s up to 27 miles away from the mainframe and increase data transfer speeds between the two from 4M to at least 10M byte/sec. ESCON support will also let users link the FEP to as many as 64 mainframes, up from 16.

One limitation of the ESCON adapter and Type 3 TIC is they work only in the new 3746; they won't fit in existing 3745 slots. Likewise, existing 3745 boards will not work in the 3746. However, the 3746 will work with existing 3745 configurations without changes to the FEP.

APPN cometh

A new version of the 3745's operating system, Network Control Program (NCP) Version 6.2, supports all of the new features and adds support for mixing multiple types of links — such as Synchronous Data Link Control, token ring and frame relay — in a single transmission group.

Transmission groups are logical groupings of physical lines, such as between FEPs, that provide added redundancy and improved performance. In the past, transmission groups were limited to one data link type.

IBM also added a frame relay data communications equipment interface to the 3745, enabling it to function as a frame relay switch in a private frame relay net. Previously, the box supported only a data terminal equipment interface that let it feed into another vendor's switch.

For users looking to begin the migration to Advanced Peer-to-Peer Networking (APPN), NCP Version 6.2 contains the support needed to create composite net nodes with VTAM 4.1, which will have corresponding APPN support.

While NCP 6.2 is scheduled to be available June 25, 1993, IBM still has not announced an availability date for VTAM 4.1. The firm said it will begin testing VTAM 4.1 this month.

Of all the 3745 enhancements, analysts were most impressed with the new 3746 expansion box.

"The enhancements to the 3745 were features that were sorely lacking in the past," said Anura Guruge, an independent consultant in New Ipswich, N.H. "The ability to grow the 3745 through the expansion model 3746 is how the box should've been designed from the start."

The 3746 Model 900 costs $37,400, while NCP Version 6 Release 2 is priced from $19,010 to $94,845, plus $47,520 for 3746 support. All of these products will be available June 25, 1993.

Software router

IBM also addressed internetworking requirements with the introduction of software that turns an OS/2 machine into a low-end bridge/router that can act as a feeder node to larger bridge or router nets.

RoutXpander/2 Version 1 supports Systems Network Architecture/APPN, Transmission Control Protocol/Internet Protocol and Network Basic I/O System data over frame relay or leased lines at speeds up to 2M bit/sec. The software requires the OS/2 machine to be outfitted with a new $795 Wide-Area Connector Adapter Board to support the wide-area network link.

Like IBM's stand-alone 6611 router, RoutXpander/2 supports Data Link Switching, which acknowledges the receipt of SNA frames and handles the link-layer flow control for SNA sessions.

"The key to this product is that it doesn't matter where in the network it is located," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C. "It can sit anywhere and pump data onto the backbone or to other branch offices."

RoutXpander/2 will be available Dec. 18 for $795. IBM also rolled out the 8250 Multiprotocol Intelligent Hub, which is its version of Chipcom's ONline System Concentrator hub. The 8250 is available in six- and 17-slot models that support Token-Ring, Ethernet or Fiber Distributed Data Interface adapters.

The six-slot model can support two FDDI adapters and any combination of up to four Token-Ring and Ethernet adapters. The 17-slot model supports as many as four FDDI, seven Token-Ring and three Ethernet adapters.

The 8250 hub will be available this week for $2,410 for the six-slot and $4,465 for the 17-slot model. A NetView Hub management/6000 module, which runs in IBM's AIX-based management system, controls the hubs and is priced at $6,500. It will be available Dec. 18.

Moving to OS/2 world

NEW YORK — IBM last week pumped up its AIX-based TCP/IP network management platform with new distributed management capabilities and a promise of closer ties to the OS/2 world.

IBM announced a new software release, Version 2 Release 1, and a new name for its AIX-based management system, AIX SystemView NetView/6000, which was previously called AIX NetView/6000. The release includes support for IBM's OS/2-based LAN Network Manager and an agent that off-loads polling chores from the central console.

"We are seeing a shift toward a distributed management environment, and we are expanding our product line to accommodate that shift," said Bill Warner, Networking Systems director of enterprise management.

Toward that end, IBM announced new smart agent software, dubbed Systems Monitor/6000. The agent resides on any networked RISC System/6000 and off-loads the Simple Network Management Protocol polling and performance monitoring functions typically performed by a central SystemView NetView/6000. Users can distribute the agents throughout their nets to monitor nearby devices and send only vital system alerts, as defined by the user, back to the central platform.

It can also be programmed to automatically respond to some alerts with commands that correct problems, such as automatically restarting a failed device.

"By having Systems Monitors distributed throughout their enterprise, [users] can grow larger networks and not have to buy multiple management platforms to support them," said John McConnell, vice-president of Infonetics Institute, a consultancy in Boulder, Colo.

To give its AIX systems better support for OS/2-based local-area nets, IBM will add to the next release of its OS/2-based LAN Network Manager an SNMP agent that reports net management data to the AIX SystemView NetView/6000 platform.

PHOTOS ©1992 DANIELLE SWICK
Bill Warner

With this support, the AIX SystemView NetView/6000 will be able to control LANs linked to the LAN Network Manager. Although IBM did not detail the extent of that control, it did say it wanted to make the AIX platform the single point of LAN management control for both AIX and OS/2 machines.

IBM also enhanced its existing LAN Network Manager Version 1.1 and LAN Station Manager Version 1 to include support for the Heterogeneous LAN Management (HLM) draft standard. HLM will give LAN Network Manager support for the Common Management Information Protocol (CMIP) but does not require a full Open Systems Interconnection stack.

Additionally, IBM announced three new or enhanced Application Program Interfaces to which software developers can build applications that run on the AIX management platform — X/Open Management Protocol (XMP) API, End User Interface and an SNMP API.

The XMP interface, IBM's first Open Software Foundation, Inc. Distributed Management Environment-compatible interface, is used to build CMIP over Transmission Control Protocol/Internet Protocol-compliant applications. The End User and SNMP Interfaces were previously available but have been enhanced to provide better alert filtering and more customizable screens.

IBM also said it would be introducing a trouble-ticket application for the AIX platform.

AIX SystemView NetView/6000 Version 2 Release 1 with the SNMP manager interface will cost $10,450. The End User Interface costs an additional $5,200. There is no charge to upgrade AIX SystemView NetView/6000 Version 1. The AIX Systems Monitor/600 will cost $750. All the products will be available in June.

— Michael Cooney

Users, vendors blast FBI plan

continued from page 1

phone switches, software used by on-line services such as Prodigy, LANs, private branch exchanges, high-speed networks such as those contained on the Internet, radio-based and cellular communications, personal computers, private networks, satellite equipment and air-to-ground aviation equipment.

The FBI said it needs the new law because the regional Bell holding companies and the independent local exchange carriers have failed to adequately address the difficulties digital networks pose to government surveillance. Digital lines are difficult to tap because signals are mixed during transmission, the FBI said, pointing to the rollout of Integrated Services Digital Network as a primary concern.

Last week the cosigners opposing the FBI's proposal acknowledged new digital technologies are making government surveillance difficult but urged the agency to resolve the problem with industry directly, rather than impose legislation that will raise costs for end users and weaken network security.

The FBI's proposal mandates that every communication services provider in the U.S. be able to isolate an individual's voice or data traffic and provide authorized government agencies direct access to it.

"The proposal requires that all telecommunications equipment in the U.S., from common carrier lines to the smallest AppleTalk network, have built-in capabilities for surveillance accessible from a remote government monitoring facility," stated the public interest group Computer Professionals for Social Responsibility (CPSR) in a statement released last week.

CPSR last week sued the FBI for not supplying documents related to the legislation, which it requested under a Freedom of Information Act request.

"It's a primal scream rather than a focused technical approach," said John Podesta, former counsel on the Senate Judicary Committee and now principal of Podesta Associates, Inc., a consultancy here. The industry and the FBI should try to work out the problem together, he said.

But the FBI last week asserted that the parties that should have come to the table to solve the problem — the RBHCs and local exchange carriers — have ignored the FBI's complaints.

"Over 2½ years ago, we started contacting industry executives to ask for assistance in doing wiretap in a digital environment," said Kier Boyd, deputy assistant director of technical services at the FBI.

Faced with the prospect of new laws, the RBHCs have now joined discussions with the FBI technical committee, Boyd said. But these negotiations are proceeding too slowly, he said, resulting in the Department of Justice recommending to Congress last week that the FBI's proposed legislation be passed.

Public switched service providers would have to be in compliance within 18 months after the law's enactment, while all other electronic communications service providers would have three years. Noncompliance would bring a $10,000 per-day fine.

The FBI's proposal gives the U.S. attorney general the power to exempt any communications provider from the new requirements.

Several of the RBHCs said they are still pursuing negotiations of both technical and policy issues with the FBI, but they acknowledged that the talks during the past six months have not yielded results yet.

"We have a real commitment to sort out the legitimate problems," said Jeff Ward, Nynex Corp.'s legislative counsel.

One source in the industry who requested anonymity, said the FBI's proposal, if enacted, could have a crushing effect on U.S. competitiveness in international markets because of the cost of creating or retrofitting equipment to the new requirements. "Who's going to buy a piece of equipment that's deliberately not secure?" he asked.

The opposition

Groups and companies opposed to the FBI's wiretap proposal

- abcd: The Microcomputer Industry Association
- Advanced Network & Services, Inc.
- Agson, Inc.
- American Civil Liberties Union
- Arrow Electronics, Inc.
- AT&T
- Cellular Telecommunications Industry Association
- Computer and Business Equipment Manufacturers Association
- Computer and Communications Industry Association
- Computer Professionals for Social Responsibility
- Digital Equipment Corp.
- Eastman Kodak Co.
- Electronic Frontier Foundation
- Electronic Mail Association
- Graphics Technologies, Inc.
- IBM
- Information Industry Association
- Information Technology Association of America
- Iris Associates, Inc.
- Logistics Management, Inc.
- Lotus Development Corp.
- Merisel, Inc.
- Micro Computer Centers, Inc.
- Microsoft Corp.
- Okidata
- Oracle Corp.
- Panamax
- PC Parts Express
- Prodigy Services, Inc.
- Seneca Data Distributors, Inc.
- Software Publishers Association
- Sun Microsystems, Inc.
- Telecommunications Industry Association
- U.S. Telephone Association
- Westbrook Technologies, Inc.

GRAPHIC BY SUSAN SLATER

Sprint details technology plans

continued from page 2

area rings operating at OC-3 speeds (155M bit/sec).

The OC-3 rings will serve four participants — Digital Equipment Corp., Hewlett-Packard Co., Stanford University and Tandem Computers, Inc. Sprint will provide participants with Fujitsu add/drop fiber multiplexers, while other on-premises gear will be provided by the users.

The project has multiple goals. The first is to have the participants — three of which are computer vendors — develop applications that take advantage of the high-bandwidth links. They would, in turn, sell the applications with the resulting packages and advance the ATM movement.

The second goal is to "explore fiber as an alternative access means," Sprint's Kero said. Currently, 45% of the charge for an end-to-end link goes to the local carrier.

"At very high speeds, it may be less expensive to lay fiber than to install copper and the repeaters needed," he said. "And it's also possible that providing users shared access to a fiber ring would be less costly than each user paying for a spoke in a star central office configuration."

The final goal of the project is to study the performance of so-called self-healing fiber rings, which several Bell operating companies have installed. "We want to see what effect these rings have on [our] network infrastructure," Kero said.

Next year, the backbone SONET loop will be upgraded to run at OC-48 (2.4G bit/sec), while the secondary rings will be upgraded to run at OC-12.

In a second project, Sprint is installing a 600-mile, 2.4G bit/sec SONET link serving the University of Kansas in Lawrence; the Army Future Battle Laboratory in Fort Leavenworth, Kan.; the EROS Data Center, a major repository of digitized geographical images; and the Minnesota Supercomputer Center in Minneapolis.

Sprint will install an ATM switch in the SONET route that will be used to provide customer access to the link. The carrier would not say if it will use the TRW, Inc. ATM switches that will be featured in a Department of Energy ATM net beginning in 1993.

Bill Pfeiffer, senior vice-president of Sprint Data Group, said the trial will help the carrier learn what kind of applications require high-capacity SONET links.

"We'll get all kinds of experience with all types of real-time imaging applications," Pfeiffer said. "If you don't start this type of project now, how can you really chart what the future holds for your network?"

> "At very high speeds, it may be less expensive to lay fiber than to install copper and the repeaters needed."
>
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Tony Alotto, director of technical programs for Sprint's network group, said the focus of the trial is to gain experience with emerging high-bandwidth applications.

The project, which will run at least three years, is funded largely by the Defense Advanced Research Projects Agency.

On the switching side, Sprint has begun testing to determine whether ATM switches from five vendors — Alcatel N.A., Inc., AT&T, Fujitsu, Ltd., NEC Corp. and Northern Telecom, Inc. — conform with national and international standards and can interoperate.

"The reality is that carriers will use a variety of switches to support ATM, so we have to make sure there is interoperability between platforms," Kero said.

Token ring products shine

continued from page 8

Systems Network Architecture traffic over wide-area nets.

3Com also announced two additional high-speed serial (HSS) WAN modules for the NetBuilder II: the single port HSS/RS-449 module, which supports RS-449 at speeds up to 155M bit/sec, and the single port HSS/G.703 module, which supports the telephone company interface commonly used in Europe.

Both modules will be available in the first quarter of 1993. Pricing has not been determined.

The company also covered new ground in the hub market with the introduction of the LinkBuilder Flexible Media Stack (FMS), a family of fixed-port, Ethernet stackable hubs that support coaxial cable, fiber and twisted-pair wiring.

Targeted at remote branch offices and work groups, the LinkBuilder FMS comes in three versions:

- **The FMS TP Hub,** which is available now for $1,295, comes with 12 twisted-pair connections and an attachment unit interface (AUI) or a choice between a fiber or BNC port.
- **The FMS Coaxial Hub,** which costs $2,195, has 10 thin-wire Ethernet ports, an AUI port and a choice of a fiber or BNC connection. It will ship next month.
- **The FMS Fiber Hub** provides 12 fiber ports and the option of having an additional AUI port or a choice between a fiber or BNC port. It will be available in the first quarter of next year and has not been priced yet.

As 3Com is largely dependent on the Ethernet adapter card market for the majority of its revenue, the sweeping announcements were seen as an attempt to better balance the ledger.

"In 1993, we expect to see a slight shift to the internetworking product side in terms of revenue but a greater shift in the future," said Eric Benhamou, 3Com's president and chief executive officer.

Analysts agreed that 3Com's moves were warranted, but difficulties still remain. "Getting into token ring was necessary, but it is an area where 3Com will face challenges," said Charlie Robbins, director of communications research at Aberdeen Group, Inc., a Boston consultancy. "They're still playing catch-up, as a lot of the features they announced are already being shipped by their competitors."

However, 3Com disagreed. "Catching up implies that we were behind beforehand, and that's not the case," Johnson said. "There is nobody else out there who is a credible player with the same product breadth in adapter cards, hubs and internetworking devices."

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FCC liberates the local loop

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with the cost of providing service.

FCC officials, users and analysts heralded the moves as a major step toward breaking the RBHCs' lock on the local loop.

"Today, my colleagues and I adopted interrelated policy items that collectively take a historic step in opening the local exchange market to the benefits of competition," said Alfred Sikes, chairman of the FCC.

The decisions are being viewed by some as the local loop equivalent of AT&T divestiture, which opened the long-distance market to competition.

"It's long overdue to start dismantling the local exchange monopoly," said Royce Holland, president of Metropolitan Fiber Systems, Inc., the alternative access provider that has pressed the FCC for more freedom in competing with the RBHCs.

Previously, alternative access providers were limited to picking up private-line traffic from buildings linked to their fiber-optic nets.

With the decision to allow greater competition for private-line access, alternative access providers will be able to serve any building in a city.

That should not only bring prices down, but also give alternative access providers an incentive to roll out new services.

The FCC also told the Bell companies they must allow rivals to locate equipment in their central offices — a practice known as collocation. That will enable competitors to pick up traffic originating in any location connected to the Bell net.

Royce Holland

The collocation order also applies to interexchange carriers and end users. Henry Levine, a telecommunications attorney who represents financial companies, said collocation would enable users to set up virtual private-line networks. Users will be able to place equipment in the central office to aggregate and handle traffic for several locations.

Several states, including Massachusetts and New York, have already ordered collocation for some services.

Initially, alternative access providers will be able to pick up only private-line access traffic. Major local carriers will have to tariff this new interconnection service in January and begin allowing competition in mid-May. But the FCC proposed to allow alternative access providers to pick up switched access traffic from Bell central offices in the future.

In return for allowing competition, the FCC will give local carriers some pricing flexibility for these offerings once interconnection is established. This would give carriers the ability to charge different prices for access services on a central office-by-central office basis.

Brian Moir, counsel for the International Communications Association, said collocation should spur competition, which will benefit users. But he expressed concern about the pricing flexibility.

It appears that as soon as the Bell companies file tariffs for collocation, they will be allowed pricing flexibility for all central offices statewide, regardless of whether collocation is available at every office. Moir said granting flexibility in advance of competition is premature and could lead to serious price imbalances from region to region.

In its ruling on access rate restructuring, the FCC put to rest dire predictions that some long-distance carriers' access costs would double or triple. The model adopted by the agency is predicted to lower AT&T's costs by about 0.6%, while rates for MCI Communications Corp. and Sprint will rise about 1% and rates for smaller carriers will rise about 1.8%.

The new plan, which is only an interim solution, will take effect in eight months and remain in effect for two years.

The impact varies by carrier because the FCC is trying to align local transport prices with service costs. Large carriers, which can purchase in large volume, are expected to pay less for service.

Local carriers are currently required to charge the same unit price for transporting calls to long-haul carriers, regardless of volume.

The FCC last week voted to allow AT&T to pay a flat rate for direct connections from the Bell companies' end offices to their central offices.

The FCC will evaluate how the interim model works and develop a permanent rate structure to take effect in the future.

Board to review U.S. policy

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ducting a review of cryptography originated last March when the group decided it would not approve NIST's proposed Digital Signature Standard (DSS) until a national review could be completed.

DSS, which provides a way to add a digital signature to a document to ensure its authenticity, has been criticized on a number of fronts, one being performance. DSS is many times slower in digital signature verification than the de facto standard public-key products from RSA Data Security, Inc.

NIST, which recently admitted that the NSA — not NIST — came up with DSS, is also wrestling to resolve patent disputes over the technology. Last week, NIST opened up negotiations with RSA, asking the company to submit a proposed uniform licensing policy for commercial vendors of DSS.

The board's national review would involve far more than DSS, however. Users and trade organizations that were asked to present their views to the board last week urged the CSSPAB to include the export of products conforming to the Digital Encryption Standard (DES), the private-key encryption algorithm implemented in an estimated 70% of encryption products.

NIST recently announced it would examine whether DES should be recertified as a government standard, and this issue will also likely be taken up in a national review.

> Users will have to consider replacing DES if the government no longer certifies it.
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"DES is definitely the cornerstone of cryptographic security from the end-user perspective," said Geoffrey Turner, senior management consultant in the information security program at SRI International. "It reflects hundreds of million of dollars in investment." Users, particularly finacial institutions, will have to consider replacing DES if the government no longer certifies it as the preferred encryption method for nonclassified data.

Both Robert Burke, director of corporate services and security at Monsanto Co., and David Peyton, senior director of government relations at the Information Technology Association of America, said the national review should examine the impact of export control on cryptography in light of the dissolution of the Soviet threat.

Burke also said surveillance by foreign government spies — in particular, the French government, known to spy on American businesspeople and pass the information to French companies — is a growing concern to U.S. companies doing business abroad.

"We want U.S. involvement in the protection of our information," Burke said. "We want to know what companies are being targeted and why. We need authorization for encryption devices to protect our information — and quickly."

The CSSPAB faces an uphill battle in collecting data on U.S. policy on export controls for encryption products since the policy is largely unpublished and controlled essentially by the hidden hand of the NSA.

"These are not published regulations," Robert Rarog, manager for export policy at Digital Equipment Corp., told CSSPAB last week.

NETWORK WORLD

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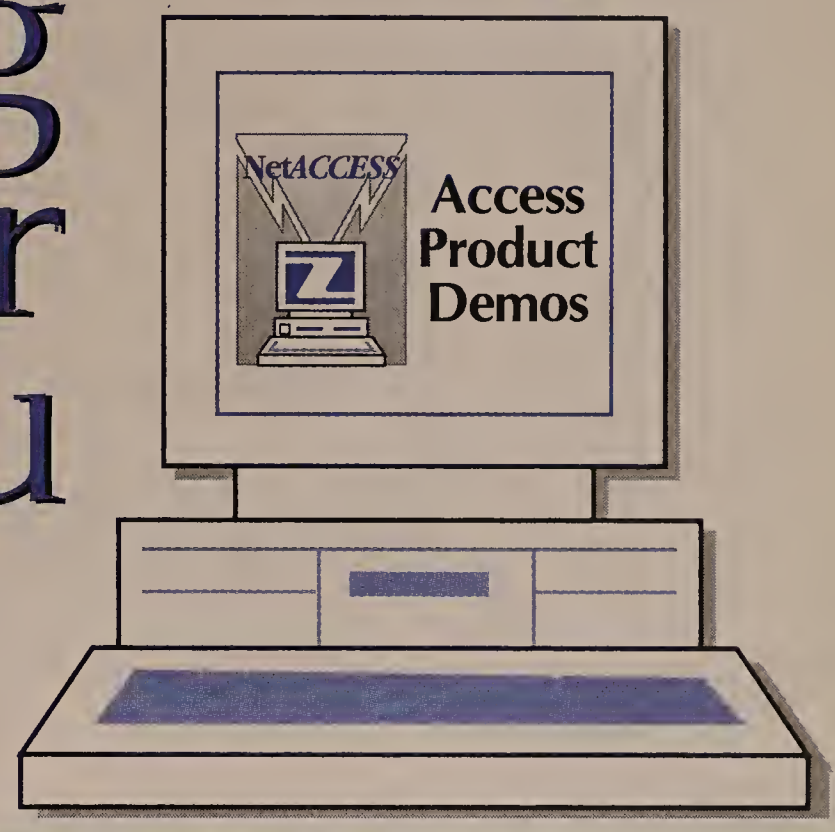

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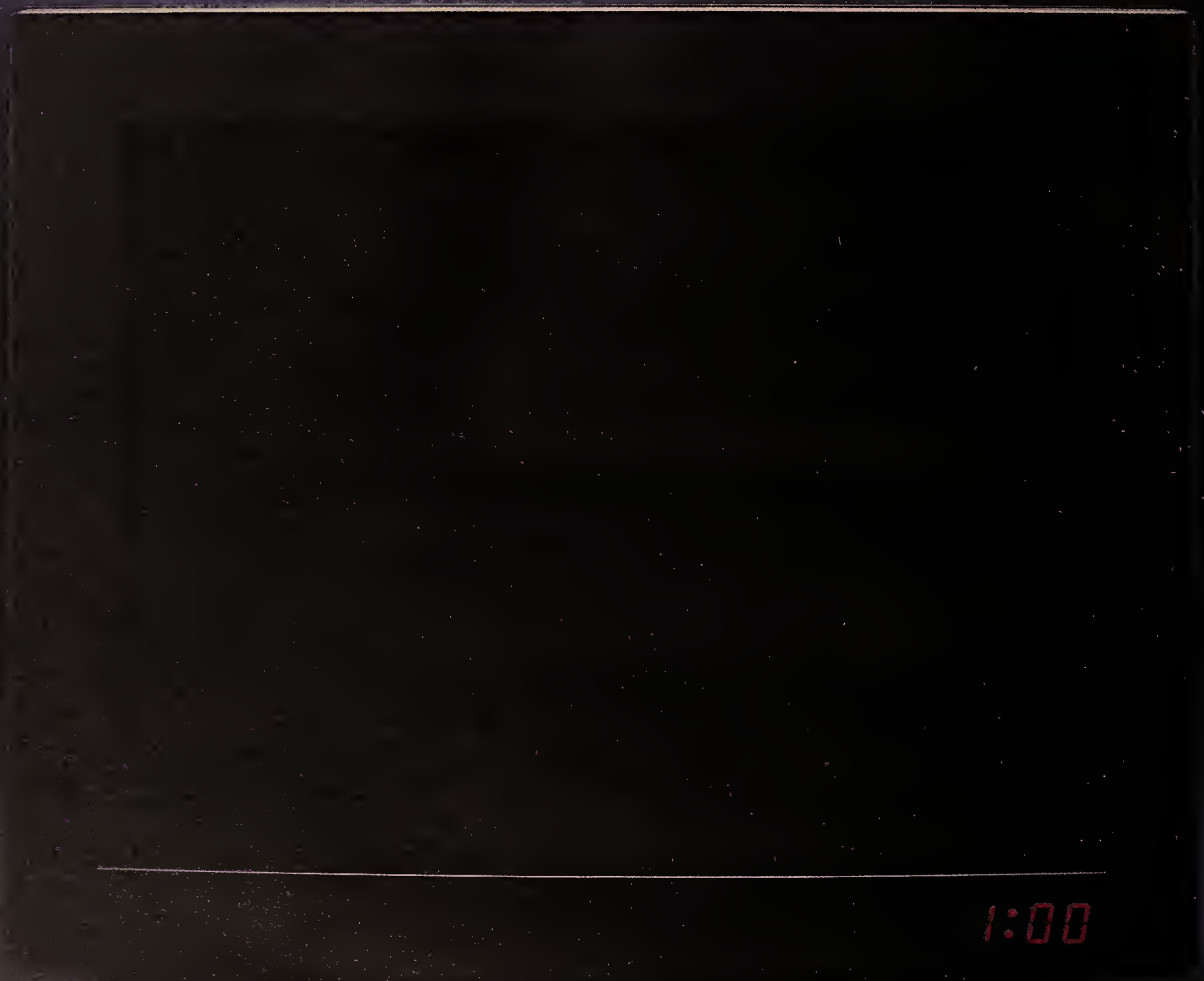

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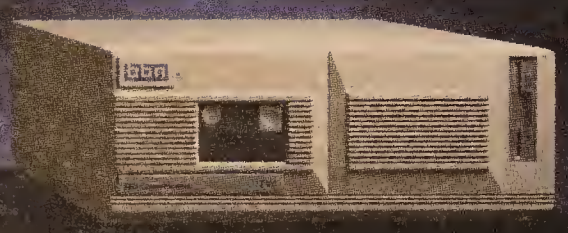

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